THE

UNITED SERVICE.

FEBRUARY 1881.

THE PROGRESS TOWARD A WRITTEN LAW OF WAR.

THE branch of international law which attempts to set bounds to the cruelties of warfare, as it was the first to be systematically discussed, so does it bid fair to be the first to take shape in a written code.

The need for some precise and authoritative statement upon the subject has become more and more manifest to those who interest themselves in such questions. Not a little of the bitterness of recent struggles has been due to differences of opinion between the belligerents, as to the rules which international law enjoins for the conduct of military operations, and as to the manner in which those rules have been, in point of fact, observed by their respective armies.

The Franco-Prussian war was especially fertile in controversies of this kind. Prussia began by announcing that, in accordance with the action of all the belligerents in the war of 1866, she would refrain from the capture of private property at sea; and she affected to consider as a violation of the law of nations the conduct of France in declining to be bound by a new rule, which would have canceled the effect of French naval superiority. Accordingly, when France, in the exercise of her otherwise unquestioned rights, confiscated merchant vessels and detained their crews as prisoners, Count Bismark, by way of reprisals, imposed a heavy fine on the occupied districts of France, and sent off forty notables to be kept as prisoners of war at Bremen. There was also a discussion as to the lawfulness of sinking prizes, instead of taking them into port for condemnation; but the operations on land afforded a much fuller series of illustrations of the vexed questions of international law. Formal complaints were repeatedly made

by each belligerent of the conduct of the other, and the newspapers on both sides were filled with angry recriminations.

In the French Senate, M. Leverrier, the celebrated astronomer, spoke of the Germans as no longer carrying on "une guerre régulière, mais une guerre de sauvages." Later, M. de Chaudordy wrote that "Prussia conducts to a war of extermination, her troops transformed into hordes of marauders. She has profited by modern civilization only to bring to perfection the means of destruction." False rumors and exaggerations abounded: that a franc-tireur had been burnt alive; that eighty per cent. of the French prisoners in Germany had died from ill treatment in three months.

The official statements on the part of the French may be found in a dispatch of the Minister for Foreign Affairs, 30th August, 1870; in dispatches by M. de Chaudordy of 29th November and 25th January, 1871; and in a dispatch by M. Jules Favre of 11th January. The complaints of the Germans may be read in an article of the Prussian *Staatsanzeiger* of 26th August, and in dispatches of the Prussian under-secretary, M. de Thile, and of Count Bismark, dated 14th December, 9th January, and 17th February. One of these documents from either side will serve as specimens for the rest.

The French minister, in August, 1870, complains: 1. That an ambulance named "de la Presse" had been carried off into Germany with all its *personnel* and *matériel*. 2. That the Baron de Bussière had been made prisoner while working with the ambulance which he had organized in the neighborhood of Strasburg. 3. That a surgeon had been killed while attending to a wounded man. 4. That the German troops had used explosive bullets. 5. That peasants in the neighborhood of Strasburg had been forced to work at the trenches directed against that town. 6. That the Red Cross had been abused to cover the treasure-carts and provisions of the Prussian army.

M. de Thile, on the other hand, reproaches the French with: 1. Bombarding open towns. 2. Omitting to give any instructions to their troops as to the Geneva Conventions. 3. Omitting to protect their surgeons with the Geneva Cross. 4. Employing Turcos; and, 5. Firing upon flags of truce.

Other topics are touched upon in other dispatches; the questions most debated being violation of the Geneva Convention, and of the Petersburg declaration against explosive bullets; the bombardment of open towns; the treatment of enemies captured in balloons; hostages; but more especially the position of franc-tireurs and other irregular combatants, and the exercise of authority by the invading army in the territory of which it is in "occupation."

In studying the labyrinth of charges and counter-charges, it is refreshing to find that there are points as to which there is no controversy. While in many cases there is a difference of opinion as to the rule which

is dictated by international law, in the majority of cases both sides are agreed as to the rule, and are at issue only as to the fact of its having been or not having been duly observed.

The questions raised during the war between Russia and Turkey were of a similar character, though less various. We used to hear again of the sinking of prizes; of the use of explosive bullets; of disregard or a fraudulent use of the Geneva Cross, and especially of the massacre and mutilation of prisoners, and the employment of savage and undisciplined auxiliaries. The complaints came from both sides, though those coming from the Russians found more credence, and were, indeed, apparently better founded.

The questions which arose as to the Geneva Convention were complicated by the discovery (which ought to have been made before) that the Mussulman troops could not be dissuaded from regarding the Cross, which it assigns by way of a protecting mark to surgeons and hospitals, as a Christian, and therefore hostile, emblem. The Porte attempted to meet the difficulty by distinguishing its own medical staff by a red crescent on a white ground, at the same time ordering its troops to respect the Red Cross flag of the enemy.

The experience of the last decade thus shows how necessary it is that troops should receive instructions in the laws of war; but before this can be done, those rules must be ascertained and reduced to writing.

A written statement of this, as of any other branch of the law of nations can, of course, become binding only by means of convention; since treaty-making on a large scale is the only substitute for legislation available to a group of independent political communities. On a former occasion[1] I have called attention to some of the results which have been attained in this direction by the Declaration of Paris, the Convention of Geneva, and the Declaration of St. Petersburg. These diplomatic acts, relating respectively to the conduct of maritime warfare, to the relief of the wounded, and to the use of explosive projectiles, might fairly be considered, but for the fact that they have not all received the adhesion of two or three states of importance, as isolated sections, inscribed in the otherwise blank pages of an international code.

It is no doubt highly desirable that these sections should be incorporated into a statute which should deal in a corrected and exhaustive manner with the whole subject; but the drafting of such a statute would be a matter of extreme delicacy. Upon some of the questions involved national interests are divergent, and upon many more there is a conflict of opinion. Maritime states are opposed to states whose strength lies elsewhere than on the sea; states whose circumstances permit them

[1] A Lecture on the Brussels Conference of 1874, and other diplomatic attempts to mitigate the rigor of warfare. Oxford and London: J. Parker & Co., 1876.

nearly to dispense with armed forces in time of peace to states less happily situated; states which recruit their armies by universal conscription to those which only rely upon voluntary enlistment; small states to large ones.

A few instances will illustrate this. The United States of America, reluctant to deprive themselves of a ready means of supplementing their normally small navy, have refused to accede to the principle of the Declaration of Paris that "privateering is and remains abolished." England, on the other hand, is not prepared to accept the view which, after long being advocated by the United States, is now the prevalent view upon the continent, in favor of the exemption of the private property of enemies from capture at sea. So jealous is our country of being committed to any concession upon this point, that the government only consented to send a delegate to the Conference of Brussels upon the understanding that questions of maritime warfare were to be entirely excluded from its deliberations. A similar feeling on the part of England was the main obstacle to the ratification of the second Geneva Convention of 1868, which provides for the neutralization of persons and ships engaged in the relief of sufferers from fighting at sea.

The differences of view which exist with reference to the conduct of warfare upon land are no less marked. A degree of strictness in defining the classes of persons who will be recognized as legitimate combatants, or in prescribing the obedience due to the invader from the inhabitants of an occupied territory, may seem perfectly natural to a Great Power, recruiting its vast armies by compulsion, while it may be thought intolerable by a small country, which relies for its safety upon mountain passes capable of being defended by a handful of peasantry.

It was upon such questions that the Brussels Conference of 1874 made shipwreck; and the difficulties in the way of any general scheme, to be elaborated by diplomacy and imposed by treaty upon the civilized world, appeared for the moment to be insurmountable.

But another course remained to be tried. The desired result may be as surely, though less rapidly approached, if each nation would frame for its own armies a statement of such rules of warfare as it thinks proper to be adopted, including, of course, those rules to which it is already committed by treaty; leaving to time and discussion the work of assimilating the bodies of rules to one another and to the ideally perfect type.

It is to this latter alternative that those military men and jurists who are most anxious that the usages of war should be systematized and reduced to writing, in order to their being better known and better observed, have of late years chiefly turned their attention.

When the Brussels Conference separated without having attained

to any diplomatically binding result, the only nations which, so far as I am aware, had compiled authoritative regulations with reference to the topics which it had discussed, were the United States of America and Germany.

The first body of rules of the kind was that promulgated in 1863 by the Northern States of America, for the guidance of the Federal armies in the civil war. It had been drawn up at the request of President Lincoln by the eminent publicist Dr. Lieber, and was sanctioned by a general order to the effect that "the following 'instructions for the government of armies of the United States,' by Francis Lieber, LL.D., and revised by a board of officers, of which Major-General E. A. Hitchcock is president, having been approved by the President of the United States, he commands that they be published for the information of all concerned."

The several sections deal with: 1. Martial law and retaliation. 2. Enemy property, protection of women, etc. 3. Prisoners, hostages, booty. 4. Spies, insurgents. 5. Safe-conduct, flag of truce. 6. Exchange of prisoners. 7. Parole. 8. Armistice. 9. Assassination. 10. Civil War. These instructions are perhaps unnecessarily long and minute. They are not well arranged, and are certainly more severe than the rules which would be generally enforced in a war between two independent states.

The German regulations, though known to exist, are in the nature of confidential instructions to officers. They were in existence in 1870, and probably more or less resemble the instructions published in that year by Professor F. Dahn. Something is also contained upon one branch of the subject in the military penal code of the German Empire of 1872, which prescribes punishments for pillage and for ill treatment of the wounded, but is less explicit upon these topics than the Prussian military code, which it superseded.

Since 1874 the movement in this direction has been more active.

At the outset of the war with Turkey a ukase of the Russian government, 12–24th May, 1877, ordered all functionaries of the empire to observe the Geneva Convention, the Declaration of St. Petersburg, and the principles laid down in the draft prepared at the Brussels Conference. In June of the same year a catechism setting forth these principles was published in the official gazette, and thousands of copies of it were distributed in the army. In July the same government promulgated a temporary *règlement* for the treatment of prisoners of war, containing minute provisions of a very liberal character.

In the same year a little volume appeared under the authority of the French government, with the title "Manuel de Droit International à l'usage des officiers de l'armée de terre—ouvrage autorisé par les écoles militaires." It is understood to have been compiled by M.

Billot. It consists of two parts. The first treats of "Hostilities," and contains four titles, dealing respectively with the means of injuring the enemy; with combatants, spies, and the wounded; with military conventions; and with prisoners of war. The second part, entitled "De l'Occupation," consists of four titles, treating successively of the powers, and of the duties of the occupying force; of persons, and of property.

As far back as 1871, M. Den Baer Portugael, since minister of war for the Netherlands, besides a treatise upon the law of war, drew up also a practical manual upon the subject for the use of officers. His government, without giving direct sanction to either work, has ordered that they shall be used as text-books for the instruction of officers.

The draft "Militärstrafgesetz," prepared for the government of Switzerland by Professor Hilty, of Berne, and published by him in 1878, contains under the heading of "Kriegsruht," a set of rules for the proper conduct of warfare.

The Danish Parliament has recently discussed a similar project, and the question has been under the consideration of the governments of Italy and Spain. I believe I may add that it is at present engaging the attention of our War Office.

Much will have been gained when the movement of which we have seen the beginnings shall have been completed: when every civilized state shall have supplied its troops with such instructions as it may think fit for the conduct of warfare.

The object next to be kept in view should be the assimilation of these national instructions to a common international type. Upon many of the questions of which they treat international law speaks with a certain voice, but upon other questions it is silent, or gives replies which are understood in different senses. In what way are the doubts thus arising to be resolved, and the resulting differences between the instructions issued by different nations to their respective armies to be made to disappear? There is but one way, scientific discussion: the reasoned speech or writing of men whose words have influence upon the opinion of nations and the action of governments.

An attempt has recently been made to bring, as it were, to a focus the authority of such reasoned speech or writing upon questions of international law.

A sort of academy of persons devoted to the study of these questions has been gathered together from all quarters of the world, under the style of the "Institut de Droit International"; and this body has paid great attention, with the practical result which I am about to relate, to developing and systematizing the rules of warfare. But first, a word or two upon the composition of the "Institut," which, as my readers may be aware, has lately held its annual meeting at Oxford. The first

suggestion of such a body was contained in a letter addressed, in September, 1871, by Dr. Lieber, of New York, to M. Rolin-Jaequemyns, of Ghent, the founder and editor-in-chief of the *Revue de Droit International.* M. Moynier, of Geneva, almost at the same time made a communication to M. Rolin to the same effect.

In March, 1873, M. Rolin acted upon these suggestions, by sending a confidential circular to a number of representative international lawyers, a dozen of whom met at Ghent in September of the same year, and founded the "Institut de Droit International." According to the statutes then drafted, the "Institut" was to be a purely scientific association, consisting of fifty full members, and a body of associates. "International law," said M. de Laveleye, in a memoir which he wrote upon the occasion, "has hitherto been developed by two methods: first, by diplomatic action; secondly, by the scientific action of individuals,—*i.e.*, by works written for the purpose of formulating the whole or part of the rules which the author believes to be followed, or thinks should be followed, in the relations of state to state. But these two methods make but slow progress, and often encounter in practice nearly insurmountable obstacles. There is room for a new influence: the collective scientific action of a permanent body, without official character, composed of specialists belonging as far as possible to different countries, and devoting themselves to ascertain and define the rules of justice, which they recognize as the rightful base of the relations of people to people. It is with this object that we have founded our Institute."

The original members proceeded to co-operate with suitable colleagues, and it was arranged that committees should be appointed for the examination of special questions, and should present their several reports to the full meeting, which was to be held once a year, in September. The first annual meeting was held at Geneva, in 1874, and meetings have since been held at the Hague, at Zurich, at Paris, at Brussels, and at Oxford. The office of president has been held by MM. Mancini, of Rome; Bluntschli, of Heidelberg; De Parieu, of Paris; Rolin-Jaequemyns, of Ghent; and Bernard, of Oxford.

The action of the Institute in the matter of the laws of war dates from its first meeting.

A committee was appointed at Geneva to study the results arrived at by the Conference of Brussels, and it did its work in a very thorough manner. The "*rapporteur*," or chairman of the committee, drew up a long list of questions, covering all the topics dealt with by the Brussels Conference, and received in reply valuable communications from his colleagues. He presented an analysis of these communications, together with a reasoned report of his own, to the Hague meeting in 1875, and the Institute, after a long discussion, adopted a series of resolutions expressing a general approval of the Brussels draft, and a wish that the

Powers should cause instructions to be given to their respective armies in the rules of international law.

In 1877 the Institute went so far as to communicate to the belligerent governments some observations on the contraventions of international law which undoubtedly occurred in the conduct of war between Russia and Turkey, and to express its hope: (1) that the Powers would bind themselves by treaty to an observance of the laws of war; (2) that the example set by England of sending military *attachés* to report to neutral governments upon violations of international law during a campaign, would be generally followed; (3) that governments would take steps to bring the laws and usages of war to the individual knowledge of their officers and soldiers; (4) that, as a guarantee for this having been done, every officer, before entering upon a campaign, should sign a declaration that instructions as to the laws of war have been read to him, and that he has received a copy of them.

At the Paris meeting in 1878, the Secretary-General, in his annual report, mentioned as desirable "a study of the codes and regulations which the governments of the various countries have recently caused to be compiled for their armies, prescribing the observance of the laws and customs of war." The standing committee on the laws of war was accordingly empowered to examine this question, and its report was read by its chairman, M. Moynier, at the Brussels meeting in 1879. The Institute having thus obtained information as to the steps which had been taken for the instruction of troops in their international duties, and finding that but slight progress had been made in this direction, determined to draw up a Manual of the Laws of War, which might serve as a sort of model to governments desirous of legislating on the subject.

The task of preparing it was intrusted to the standing committee, of which M. Moynier is chairman. The manual was to be compiled after a comparison of the Geneva Conventions of 1864 and 1868, the Petersburg Declaration of 1868, the Brussels Project of 1874, the Hague resolutions of the Institute, and the instructions prepared for the use of the respective armies of the United States, France, Russia, and the Netherlands.

With these materials before him, M. Moynier set to work, and by February of the present year had produced an excellent draft, of which he sent a copy, with explanatory memoranda, to every member of the Institute. Criticisms and suggestions were forthcoming in great abundance, and M. Moynier profited by many of them in preparing a second draft, which was circulated in the same way as the first had been. In June the committee assembled from all parts of Europe at M. Bluntschli's house at Heidelberg, and sat during several days, considering very carefully the second draft, and the criticisms that had been made upon it. A third draft, as amended by the committee, was then printed and circulated. Early in September the committee again sat at Oxford,

and put the draft into the final shape in which it was to be submitted to the Institute, to be accepted or rejected. On September 9, the Institute, in full session, adopted the work as its own, and ordered that a copy of it should be sent to the principal governments, with a letter respectfully representing that it is the duty of every nation to issue some such body of instructions for the use of its armies.

The Manual is divided into three parts, of which the first lays down general principles, the second applies them in detail, and the third relates to the punishment which the laws of each country ought to prescribe for violations of them.

The style and method is the result of a compromise. If a French or German jurist were left to himself, he would probably begin with some highly abstract proposition, from which the subordinate rules would be logically deduced. The text as it stands plunges at once into the subject, by laying down that acts of violence are permissible in warfare only between the armed forces of the belligerent states. A definition is therefore necessary of the armed forces of a state. These are said to comprise: (1) The army, properly so called, including the militia; (2) the national guard, landsturm, free corps, and other corps, provided they unite the characteristics of (*a*) being under a responsible chief, (*b*) having a uniform, or distinctive mark, which is fixed and recognizable at a distance, (*c*) carrying their arms openly; (3) the crews of ships of war; (4) the inhabitants of an unoccupied country who, on the approach of the enemy, take up arms spontaneously and openly to fight the invader, even although they have not had time to organize themselves.

Another important principle relates to the legitimate object of warfare; which, in the words of the Petersburg Declaration, is defined to be "the weakening of the military forces of the enemy." Hence the illegality of severities which are unnecessary for the attainment of this object.

The statement that the authority of the invader in an unoccupied territory is a mere *pouvoir de fait*, and *essentiellement provisoire*, is the key to a number of the subordinate rules which apply to this important topic.

The body of the work, which consists of an application in detail of these general principles, deals successively with hostilities, with occupied territory, with prisoners of war, and with troops interned in a neutral territory.

Hostilities are considered with reference first to persons and secondly to things. Under the former heading come such topics as the treatment of the inoffensive population; weapons and other means of injuring the enemy; the wounded; prisoners of war; spies and flags of truce. Under the latter, pillage; the bombardment of towns; and the treatment of ambulances and medical stores.

A territory is said to be "occupied" when, "in consequence of its being invaded by the forces of the enemy, the state to which it belongs has ceased, as a matter of fact, to exercise there a regular authority, and the invading state is alone in a position to maintain order there. The limits within which this is the case fix the extent and the duration of the occupation.

Then come rules as to the rights and duties of the army of occupation towards persons. May it oblige civil functionaries to continue to perform their duties? How far may it force the inhabitants generally to render services? May it oblige them to take an oath of obedience? What may be done in case of local insurrection?

Under the heading of the rights and duties of the occupant in respect of things, we find rules as to the kinds of public property which may be seized by the invader, the limits of his rights over state forests, the inviolability, in general, of private property, subject to exceptions with reference to railways, telegraphs, and stores of arms and ammunition, and also to the right of the invader to levy requisitions and contributions.

The rules with reference to prisoners of war deal with the means which may be taken to prevent their escape, the kinds of work which may be required of them, the expense of their maintenance, the consequences of an attempt to escape, their exchange and release upon parole.

The chapter upon the internment of troops which have been obliged to cross the boundaries of a neutral territory, as the army of Bourbaki was forced to enter Switzerland during the Franco-Prussian war, is occupied with rules as to their disarmament, detention, and maintenance by the neutral power.

The third and last part of the Manual, besides dealing briefly with the sad though unavoidable topic of military reprisals, in which the innocent may often suffer for the guilty, suggests a clause which would incorporate by reference such legislative provisions as each state may think fit to make for the punishment of offenses against the laws of war.

The work to which attention has been called, which will be published in the usual way as soon as copies of it have been forwarded to the several governments, is, I think, interesting for two reasons:

First, as a sample of what may be done by the "collective scientific action" which, as M. de Laveleye wrote, it is the object of the Institute to promote. Having had the honor of serving on the committee by which the Manual was prepared, and thus of watching its gradual improvement at each stage of its growth, I have been much struck by the advantage of getting a number of competent persons to work simultaneously upon one subject, even when oral discussion of their differences of opinion has been only partially possible. It is surprising to

see how, when a phrase has been carefully considered for months, it is still possible for a fresh mind to make a suggestion for its amendment, which every one at once sees to be an improvement.

Secondly, the Manual is interesting as preparing the way for a generally accepted written law of war. It will at least recall the attention of the various governments to the duty of promulgating authoritative instructions upon the subject for the use of their armies; and we may perhaps hope that it may serve in some measure to shape the instructions which may be issued in the future, and to modify those which are already in existence.

I have some reason to believe that there is a chance of the Manual being adopted by the governments of Italy and Spain. Our own government is not too ready to systematize, and has been hitherto content in these matters to "trust to the good sense of the British officer"; but the powers that be are less disinclined now than was formerly the case to take a hint from what is going on in other countries; and the British officer himself would, I am convinced, be the first to rejoice if our Manual, or some body of instructions resembling it, were made generally known to the troops which he is called upon to command.

T. E. HOLLAND, D.C.L.,
Professor of International Law in the University of Oxford; Membre de l'Institut de Droit International.

THE RETURN OF THE "RESOLUTE" TO THE QUEEN OF ENGLAND.

THE announcement of the British Admiralty that a piece of furniture, as a memento, had been constructed from the timbers of the historical Arctic ship "Resolute," recently broken up at Chatham Dock-Yard, and would be presented shortly, by Sir Edward Thornton, the British minister, to the President of the United States, through the Hon. William M. Evarts, Secretary of State, cannot help reviving the interest which had been felt in that vessel, and recalling to mind a graceful act of this government, that manifested itself by Congress, in 1856, passing a resolution authorizing her purchase from the salvors (Great Britain having relinquished all claim to her), and directing that the vessel be fully repaired and thoroughly equipped at one of our navy-yards, with a request to Her Majesty's government that the United States be allowed to restore the "Resolute" to the service to which she had formerly belonged; and for this purpose the sum of forty thousand dollars had been appropriated by Congress during the administration of President Pierce. Before narrating some of the interesting incidents of her formal transfer to the Queen of Great Britain and Ireland, which took place December 16, 1856, at Cowes, England, I will endeavor to furnish a brief history of the "Resolute," and of the circumstances that gave rise to her falling into the possession of the United States government. The hull of the "Resolute" was strongly constructed of teak, and otherwise admirably adapted for Arctic explorations, of which she had given proof on a former occasion. She was of five hundred tons burden, and bark-rigged. Her armament consisted of two small brass guns for signaling purposes, and she was also well supplied with small-arms.

She sailed from England in 1852, under the command of Captain Kellett, as one of the expedition of Sir Edward Belcher in search of the missing explorers composing the party of Sir John Franklin, who left England, with the "Erebus" and "Terror," in May, 1845, to solve the problem of a northwest passage by water in the Arctic Ocean, which had been the dream of his life.

The vessels referred to were last seen by a whaler July 26, 1845, in lat. 74° 48′ N., and long. 66° 13′ W., near the middle of Baffin's Bay,

made fast to an iceberg, awaiting an opening into Lancaster Sound. In 1847 alarm was felt in England for the first time for the safety of these ships, which caused the British government to send out expedition after expedition to ascertain the fate of the missing explorers, who numbered one hundred and thirty-four officers and men when they left England. The United States government also aided in this noble enterprise by dispatching an expedition, in 1850, composed of two small sailing-vessels, the "Advance" and "Rescue," commanded by the late Lieutenant Edwin J. De Haven, U.S.N., who divided the honor with the English Arctic explorers in the discovery of the first winter quarters of Sir John Franklin on Beechy Island. The statement of William H. Murdaugh, acting master and executive-officer of the "Advance," is so clear on this point, as well as interesting, that I have no hesitation in quoting from it:

"The 'Advance' and 'Rescue,' our vessels, Captain Penny, R.N., with brigs, the 'Lady Franklin' and 'Sophia,' and Sir James Ross's schooner, the 'Felix,' were all tied up to the shore between Beechy Island and Point Innes, the ice being too tightly packed to admit of movement on the part of our vessels. Bits of canvas, rope-yarns, and probably a preserved meat-can, had been picked up on the shore, which indicated that Franklin's party had been there at some time. As nothing could be done in the way of advancing in the vessels, the commanders of the different expeditions, after consultation, agreed to send out parties to scour the adjacent country, hoping to gain some information about those we were in search of. As our vessels were to the left, we took the country to the left; the English took to the right, on which side was Beechy Island. I struck inland with a party, and after a while found, in the shingle with which the ground was covered, the marks made by the runners of a sled, and distinct indications made in the shingle by the feet of the men who were drawing the sled. You may imagine my feelings in getting hold of such a clue. I was following up this clue, treading in the footsteps of Franklin's men, when I heard the shouts of those who had gone to the right, and saw the running of many persons from the vessels towards Beechy Island. I turned back, and learned that Franklin's winter quarters for the first winter had been found on Beechy Island, with the graves of the three men who had died there, belonging to the 'Erebus' and 'Terror,' which bore the date of 1845 and 1846. It was of course the mere accident of the English going to the right that made them the discoverers of the winter quarters.

"The track I was following was, no doubt, that of some expedition sent from Franklin's party to explore the eastern shore of Wellington Sound, which was all *terra incognita* in those days."

This important discovery, the first traces of the missing party of Sir John Franklin, stimulated other expeditions to renewed efforts. Mc-

Clintock, an old Arctic explorer, found near Cape Herschel, in 1859, a bleached skeleton lying on the shore, and close by fragments of European clothing, a pocket-book, and a few letters. There were also discovered near Cape Felix several cairns, one a large one at Point Victory, and lying among the loose stones which had fallen from the structure was found a tin can, containing a record, the first authentic one of the lost expedition, and which read as follows, written on one of the printed forms then used in discovery ships for the purpose of being inclosed in bottles and thrown overboard to ascertain the direction of currents:

"28th of May, 1847.

"H. M. Ships 'Erebus' and 'Terror' wintered in the ice in Lat. 70° 05′ N., Long. 98° 23′ W. Having wintered in 1846–7 at Beechy Island, in Lat. 74° 43′ 22″ N., Long. 91° 39′ 15″ W., after having ascended Wellington Channel to Lat. 77° N., and returned by the west side of Cornwallis Island, Sir John Franklin commanding the expedition. All well. Party consisting of two officers and six men left the ships on Monday, 24th of May, 1847.

"WM. GORE, Lieutenant.
"CHAS. F. DES VOEUX, Mate."

Around the margin was written in a different hand this additional piece of valuable information:

"April 25, 1848.

"H. M. Ships 'Terror' and 'Erebus' were deserted on the 22d of April 5 leagues N. N. W. of this, having been beset since 12th of Sept. 1846. The officers and crews, consisting of 105 souls, under the command of Capt. F. R. M. Crozier, landed here, in Lat. 69° 37′ 42″ N., Long. 98° 04′ 15″ W. This paper was found by Lieutenant Irving under the cairn, supposed to have been built by Sir James Ross in 1831, four miles to the northward, where it had been deposited by the late Commander Gore, in June, 1847. Sir James Ross's pillar has not, however, been found, and the paper has been transferred to this position, which is that in which Sir James Ross's pillar was erected. Sir John Franklin died on the 11th of June, 1847, and the total loss by deaths in the expedition has been to this date 9 officers and 15 men."

"JAMES FITZ JAMES,
"Captain H. M. S. 'Erebus.'
"F. R. M. CROZIER,
"Captain, and Senior Officer.
And start on to-morrow, 26th, for Back's Fish River."

The "American Encyclopedia," from which this extract was obtained, states that the date 1846–47 given as that of Franklin's wintering at Beechy Island is evidently an error; it should be 1845–46. Captain McClintock also succeeded in finding a large number of relics of Sir John

Franklin's party, many of which had been purchased from the natives. The recent land expedition in the Arctic regions by Lieutenant Schwatka, U. S. Army, who set out from New York in June, 1878, failed to discover any written records of Sir John Franklin's party, which, no doubt, were either destroyed by the elements or Esquimaux, who considered them as valueless. Lieutenant Schwatka, however, found other relics of the lost expedition, and among them, the most precious of all, were the remains of an officer, Lieutenant Irving, who had belonged to H. M. S. "Terror," and were identified as such by a medal this officer had received in England from a scientific society, awarded him for a mathematical essay.

Lieutenant Schwatka kindly and thoughtfully took charge of the remains, which have recently been forwarded to the relatives of this brave officer in England,—an act that cannot help endearing him to all Englishmen.

This extraordinary expedition of Lieutenant Schwatka, conducted in a climate where the thermometer has stood 100° below the freezing-point, has established for himself and companions a reputation for endurance and perseverance under the most trying difficulties that has placed them in the foreground of Arctic explorers.

The American expeditions of Lieutenant Edwin I. De Haven, Dr. Kane, Dr. Hayes, and Captain Hall resulted in very important geographical discoveries, and are so well known as to render it unnecessary to call attention to them in a narrative of this kind, which has chiefly for its object the history of the "Resolute"; but it will not be amiss to state, however, that the services of the De Haven expedition, which returned to the United States in 1851, after undergoing much privation and considerable danger from being inclosed in the ice many months, were fully appreciated in England, insomuch that the officers and men were presented by the British government with an Arctic medal, as an acknowledgment of what they had endured in the cause of suffering humanity.

Notwithstanding the most strenuous efforts that had been made to rescue the party of Sir John Franklin, all, no doubt, perished from starvation and exposure to the rigors of an Arctic climate while wending their way south on the bleak shores of King William's Land; a fact clearly ascertained by the brave explorers of England and the United States who discovered the remains of these unfortunate men, which, in almost every instance, received a burial from their equally unfortunate companions. Having thus, in a very imperfect manner, endeavored to keep up the connection between the "Resolute" and the service upon which she had been employed, I will now devote a few lines to her subsequent career, which I have gathered from such data as I can command at this period.

The "Resolute" was abandoned May 15, 1854, with other vessels

of the expedition to which she belonged, when ice-bound, not far from Beechy Island, by order of Sir Edward Belcher; her officers and crew seeking refuge on board of other vessels, more fortunate in not being frozen up, that conveyed them in safety to England in 1854. The "Resolute," thus left to her fate, with not a living soul on board to regulate her movements, drifted a distance of twelve hundred miles, and though hard pressed by the ice for many months, was, when discovered, September 15, 1855, by Captain Buddington, of the American whaler "George and Henry," found to be staunch and seaworthy. By the efforts of Captain Buddington and his crew, who approached the "Resolute" in boats dragged over fields of floating ice, she was extricated and brought to New London, Connecticut. Shortly afterwards Congress passed the joint resolution already referred to, and in pursuance thereof the vessel was sent to the New York Navy-Yard, then commanded by the late Captain A. Bigelow, U.S.N., who had distinguished himself as a brave and energetic officer in the Mexican war, and under instructions he received from Mr. John Lenthall, chief of the Bureau of Construction and Repair, the "Resolute" underwent a thorough overhauling to her hull, spars, boats, and sails. While breaking her out, and in restoring her hold, great care was taken with every article found in her at the time of her arrival at the navy-yard, which included many personal effects belonging to the officers and crew of the "Resolute," who necessarily were obliged to leave almost everything belonging to them when the order came to abandon her.

During the fitting out of the "Resolute" at the New York Navy-Yard she attracted a great deal of attention from a large number of persons, who manifested much sympathy for the unfortunate party of Sir John Franklin. The "Resolute" was reported the latter part of October, 1856, ready in all respects for her officers and crew. She left the navy-yard, November 13, 1856, with a complement of twenty-five men, in tow of a tug, with the following officers on board, who had been selected by the Secretary of the Navy, the Hon. J. C. Dobbin, for the performance of this pleasing duty, viz.: Commander, Henry J. Hartstene; Lieutenants, Clark H. Wells, executive-officer, Hunter Davidson, Edward E. Stone; Surgeon, Robert Maccoun; and Doctor Otis, Captain's Clerk.

When the tug cast off the "Resolute" outside of Sandy Hook, three parting cheers were given by the officers and crew in honor of Henry Grinnell, who had accompanied them thus far, and who, with George Peabody, had contributed so generously towards fitting out the "De Haven" and "Kane" expeditions. The "Resolute" then spread her sails for England, blessed with a fair wind, which continued until the Scilly rocks were sighted, on the morning of December 11, 1856, when the wind suddenly died away to a calm, leaving the vessel in a somewhat dangerous position, as the breakers could be distinctly seen from

her decks; however, good fortune attended her, a light breeze soon springing up, which carried the vessel inside of the British Channel, where an English pilot was received on board.

The wind by this time increased to a heavy northerly gale, rendering it necessary to make frequent tacks to avoid approaching too near the coasts of England and France, upon whose shores many a vessel has been wrecked by the treacherous currents which so often confuse the most skillful navigators. The "Resolute" again escaped this second danger, the gale moderating so much as to enable her to anchor at Spithead the next day at 2 P.M., December 12, 1856, with the American and English ensigns flying side by side at the peak. Shortly afterwards Captain Peel, of H. B. M. ship "Shannon," son of the late Sir Robert Peel, came on board, extending to us a hearty welcome, followed by another English officer from the Admiralty yacht, with the usual tender of services and congratulations upon our safe arrival, with which he had been charged by Sir Thomas Maitland, then temporarily in command of the dock-yard at Portsmouth during the absence of Sir George Seymour. The passage of the "Resolute" in so short a time, twenty-nine days, surprised our English friends, as she was known in the British navy to be a dull sailer. The next day at noon a royal salute was fired from the old "Victory," Nelson's flag-ship at the battle of Trafalgar, and from the batteries on shore, in honor of our arrival.

Captain Hartstene then landed at Portsmouth in a government steamer, placed at his disposal by order of Sir George Seymour, and in pursuance of his instructions from the Secretary of the Navy, proceeded to London with the view of conferring with the Hon. George M. Dallas, United States minister to the court of St. James, as to the manner in which he should proceed in restoring the "Resolute" to the British government. Captain Hartstene was also intrusted with an open communication from the Secretary of the Navy, addressed to Sir Charles Wood, the First Lord of the Admiralty, who, it was presumed, would advise him further as to the proper disposition of the ship in the event of Her Majesty's government accepting her. While Captain Hartstene was absent on this duty the vessel was visited by a large number of persons, including many officers of the British navy who had served in the Arctic expeditions, and who manifested no little satisfaction and pleasure in beholding once more the "Resolute" now safely at anchor in English waters, reviving, at the same time, their recollections of the dangers through which they had passed while in search of the Sir John Franklin expedition.

The writer of this article recurs with great pleasure to the many courtesies and hospitalities extended to him and his brother officers by the officials of the dock-yard, the corporation of Portsmouth, as well as by the clubs of London and other English towns, during their stay at Spithead.

By express instructions from the Admiralty, accommodations were prepared for the officers at the first hotel in Portsmouth, the "Portland House," and orders issued for a bountiful supply of provisions to be sent every day on board of the "Resolute" for her crew, also a *carte-blanche* on the railroad to London for the officers. The "Resolute" excited so much interest throughout England that Her Majesty the Queen expressed a desire to visit her, and requested the ship might be taken to Cowes, near Her Majesty's private palace, Osborne Castle, which was accordingly done the day before Captain Hartstene returned from London, to whom I telegraphed the wishes of the Queen, that had been conveyed to me by Sir George Seymour, vice-admiral, commandant of the dock-yard, Portsmouth, who extended every facility for moving the vessel, sending a government steamer for that purpose the next morning, December 14, which took the "Resolute" in tow, escorted by two small steamers, and by H. B. Majesty's frigate "Retribution." On the arrival of the "Resolute" off Cowes, it was thought advisable that an attempt should be made to haul her alongside of Trinity pier, which would make it more convenient for the royal party to visit the ship.

With the assistance of a number of English seamen, detailed from the vessels of war that had escorted us from Spithead, this was accomplished by daylight the next morning, and proved to be no easy task, as the vessel had to be forced through shallow water some distance by means of hawsers made fast to the pier. The decks were then cleared up, and after a hurried breakfast the word was passed for the crew to dress in their best mustering-clothes, and the officers requested to appear in full uniform. Captain Hartstene then made his appearance on board, having traveled in the night-line from London. The "Resolute," on this occasion, was dressed off with flags, presenting a fine appearance, and what proved most pleasing to the eye was the spectacle of the United States and English ensigns flying side by side from the peak of the vessel. The English men-of-war at anchor a short distance off were also dressed with flags, and among them was displayed the ensign of the United States, hoisted at the fore of each vessel. A few minutes before 10 A.M., December 16, 1858, two mounted couriers made their appearance, announcing the approach of the royal party, who, almost at the exact time appointed for their visit, alighted from their carriages abreast of the ship, consisting of H. B. Majesty the Queen, Prince Albert, Prince of Wales, Princess Royal, and Princess Alice, with two maids of honor, the Duchess of Athol and Miss Cathcart (daughter of the brave General Cathcart killed at Sebastopol during the Crimean war, in the year 1854), followed by a number of other distinguished persons belonging to the royal household. The members of the royal family were dressed in mourning for the death of a German prince, in accordance with royal etiquette, and this circumstance prevented a more formal reception of this distinguished party, which would otherwise

have been extended to them; besides, Her Majesty the Queen had expressed a desire that there should be as little ceremony as possible, regarding her visit to the "Resolute" as a personal one, prompted by a feeling of kindness and appreciation of the resolution of Congress restoring the vessel to her sovereignty. When the Queen and Prince Albert, followed by the immediate members of her family, stepped on board, they were received with three cheers by the crew of the "Resolute," who were stationed on the rail of the vessel. Vice-Admiral Sir George Seymour then presented Captain Hartstene to Her Majesty, who addressed her in the following appropriate language:

"Allow me to welcome your Majesty on board of the 'Resolute,' and in obedience to the will of my countrymen and of the President of the United States, to restore her to you, not only as an evidence of friendly feeling to your sovereignty, but as a token of love, admiration, and respect personally to your Majesty." To which the Queen graciously replied by saying, "I thank you, sir." Immediately after this simple reception by Captain Hartstene, who reflected the sentiments of the people of the United States towards Her Majesty, the English men-of-war, whose yards were manned, fired a royal salute, with the royal standard hoisted at the main, which added very greatly to the scene, impressing at the same time most favorably the numerous spectators who were attracted by the presence of the royal party. Captain Hartstene then presented the officers of the "Resolute" to Her Majesty, Prince Albert, and to the other members of the royal family. After inspecting every object of interest on the spar-deck of the vessel, the royal party descended to the cabin by invitation of Captain Hartstene, where a collation had been spread for them, notwithstanding Her Majesty had previously expressed a wish, through one of her household, that this should be dispensed with. While in the cabin, which was hardly large enough to contain the royal party and officers of the "Resolute," the Queen manifested the greatest curiosity in wishing to be informed by Captain Hartstene of all the incidents connected with the finding of the vessel by Captain Buddington, of the American whale-ship "George and Henry," and of her restoration by the people of the United States, through their representatives in Congress. Indeed, I may say that nothing seemed to have escaped the observation of the Queen, not even a little copper tea-kettle standing on top of the cabin stove: the exact position where it had been found by Captain Buddington; also a musical box that belonged to Lieutenant Bedford Pim, an officer of the "Resolute" at the time she was abandoned in the ice.[1] The affability,

[1] This officer, recently a member of Parliament, had crossed over the ice a distance of sixty miles, while belonging to a previous expedition, and communicated with Captain McClure, of the "Investigator," in 1850, who commanded the Behring Strait expedition, and was forced to abandon his vessel after having been buried in the ice three years. He and his companions were rescued by Sir Edward Bel-

as well as simplicity of the royal family during their visit to the vessel, made a most pleasing impression upon the minds of the officers, which will be long remembered by them.

The beauty of Princess Alice, then about ten or twelve years old, was much extolled by the officers; and this, with other lovely traits of character, caused her to be much beloved when she grew up to womanhood. But, alas! her recent death, after her marriage to the Prince of Hesse, has added to the grief of Her Majesty, who had, some years before, been called to mourn the loss of her husband, Prince Albert. The latter, it is well known, cherished feelings of friendship towards the United States at a time when this country needed friends abroad, which affords me no little gratification to mention in this narrative as a tribute of respect to his memory. As the Queen of England has always been held in high estimation by the people of this country, it will not be amiss, I hope, to allude to her personal appearance; and while not coming up altogether to our standard of good looks, she retained traces of that beauty which had distinguished her in the days of her youth when she became the bride of Prince Albert. My attention was also called to the young Prince of Wales, the heir-apparent to the throne, to whom I had the honor of showing the vessel, and who evinced by his intelligent questions and answers that great care had been taken with his education by his royal father, Prince Albert, to whom he is indebted for much of his success in life, representing of late years on more than one occasion Her Majesty the Queen at court, and in the reception of distinguished officials.

Like all members of the Guelph family, the prince is gifted with an excellent memory for names and incidents that have come under his observation, and this was exemplified in 1872, in the waters of Southampton, England, on the occasion of his visit to the squadron of the United States, commanded by the late Rear-Admiral James Alden, who happened to mention to the prince, while he was looking at an engraving hanging up in the cabin of the "Brooklyn,"[2] representing the visit of the royal party to the "Resolute" in 1858, that one of his captains, now on board, had had the honor of serving in that vessel, when the prince expressed, through the admiral, a desire to meet me, and, on my entering the cabin, cordially extended his hand, remarking playfully that "he was glad to see me once more, and was pleased to know that I had been a shipmate of his many years ago," and that "his recollection of his visit to the historical ship 'Resolute' was clear and distinct." This pleasant interview was followed by an introduction to his lovely

cher in 1853, and were the first who ever entered Behring's Strait and returned to Europe by Baffin's Bay, thereby establishing the fact of there being water communication between Behring's Strait and Baffin's Bay.

[2] The "Brooklyn" on this occasion was temporarily the flag-ship, owing to cases of sickness on board the "Wabash."

princess, daughter of the king of Denmark, whose remarkable beauty was of the most striking character. Her sweetness of disposition has deservedly endeared her to the English people, by whom she is idolized.

Previous to the departure of the Queen and royal household, she extended to Captain Hartstene, through one of her suite, an invitation to dine and spend the night at her palace, which he accepted, and in his official report to the Honorable Secretary of the Navy, J. C. Dobbin, he states that he had been there treated with the most distinguished attention. Through the same official channel the Queen also invited the other officers of the "Resolute" to visit Osborne Palace, sending carriages for that purpose, which was meant to mark her sense of the courtesy extended to her and to the members of her family on the occasion of her visit to the ship. The opportunity of visiting Osborne Castle, the favorite summer residence of Her Majesty, under such pleasing circumstances, enabled the officers to see the home-life of Her Majesty, free from the ceremony and etiquette of a court, which she necessarily is obliged to keep up at Buckingham Palace as Queen of England. Osborne Castle is a modern structure regally furnished throughout, and commands a superb view of the surrounding country. It is situated on the Isle of Wight, a short distance from East Cowes. The grounds are quite extensive, embracing two hundred acres, under a high state of cultivation, and gave evidence of the care and taste displayed by Prince Albert, who considered it a model farm during his lifetime. While the officers were being conducted over this beautiful place, the Queen was frequently met unattended, and invariably returned their salutes in the most pleasing manner. This island, the garden-spot of England, is twenty-three miles long and fourteen wide. It contains a population of sixty-six thousand, and is separated from the mainland by the roadstead of Spithead and the Solent. The famous "Carrisbrooke" Castle in which Charles the First took refuge is on this island, and is much visited on this account by sight-seeing Americans.

In thus bringing to a close the visit of the royal family to the ship "Resolute," I desire to mention that Her Majesty presented Captain Hartstene with a beautiful sword, which Congress, by a joint resolution, allowed him to accept. The Queen also presented one hundred pounds to the ship's company, which she wished to be considered as a present from herself. This was conveyed through the Honorable C. B. Phipps, Keeper of Her Majesty's Privy Purse, in a note addressed by him, inclosing the check, to Captain Hartstene, who accepted the present and distributed the amount to the crew. On the following morning, December 17, the "Resolute" was towed up to the harbor of Portsmouth, escorted by H. B. M. steam frigate "Retribution," and on arriving at her anchorage was received with another royal salute, while a large concourse of people on the water-front gave expression to their feelings by repeated cheers and waving of handkerchiefs.

During the few days at Portsmouth the "Resolute" was honored with a visit by the widow of Sir John Franklin, who manifested great interest in the vessel, no doubt recalling to her mind the sad fate of her husband. Notwithstanding the numerous expeditions sent to rescue him and his companions, Lady Franklin still persevered in her efforts to induce the British Admiralty to send out another expedition, though she had then contributed almost all of her private fortune for this cause, so that at her death her circumstances, I had been informed, were considerably straitened. The late Sir Robert Murchison, who accompanied Lady Franklin on her several visits to the ship, strongly advocated the fitting out of other Arctic expeditions, even after the British Admiralty had almost decided not to risk any more lives in that part of the world. Lady Franklin, though well advanced in years at the time of meeting her on board of the "Resolute," never abandoned all hope of seeing her husband alive, therefore it is not to be wondered at that she clung to this feeling up to the last moment of her existence. She necessarily excited much sympathy from the officers of the ship, who invariably treated her with great kindness and attention, which was so much appreciated by her that she bestowed upon each officer a small token of remembrance. The one which I received, a miniature group of vases joined together, I have carefully preserved up to this day. I had also presented me, as a souvenir of my visit to England, a beautifully bound copy of Shakspeare by Lieutenant Malcom, R.N., whose father, the late Admiral Sir Pultney Malcom, commanded the English naval forces stationed at St. Helena during the first years of the captivity of the Emperor Napoleon, and is most favorably mentioned in Dr. O'Meara's work, "A Voice from St. Helena," as having won the esteem and admiration of the Emperor by his kind manner and sympathy, that always insured him a cordial welcome at Longwood.

The few remaining days spent at Portsmouth afforded the officers of the "Resolute" an opportunity of accepting an invitation to a banquet given by the mayor and corporation at the "Portland House," Charles Crasweller, Esq., mayor of Portsmouth, presiding. There were nearly thirty members of the town council present, besides a large number of distinguished officers of the British army and navy. The dining-room was elegantly decorated with suitable flags and devices, and the table ornamented with beautiful flowers. The first toast on this occasion was "The Queen," followed by that of "The President of the United States," which was given by the mayor and greeted with enthusiasm. The speeches that were made afterwards by the distinguished company were of a character most complimentary to the people of the United States, and met with a hearty response from the officers of the "Resolute," particularly one by Dr. Otis, captain's clerk, who said, in reply to a toast given to Henry Grinnell, "that he was happy, in the unexpected absence of Mr. Cornelius Grinnell, to thank them on behalf of

his distinguished countrymen. The distance between England and America was not so great that common sympathies could not be interchanged. (Cheers.) Sir John Franklin left the English shores on a mission of science in which Americans were equally interested, and when, after years had passed, tidings came that the gallant Sir John and his companions were imprisoned in the Polar Zone, and that the British government had sent expedition after expedition to their relief,—when the noble Lady Franklin had thrown her fortune and influence into the cause of aid and rescue,—the spirit of sympathy was communicated to the American people; it was taken up and embodied by the merchant prince to whom they had just done honor, and carried out with a generous zeal and energy of which Americans might well be proud." (Applause.)

In order to perpetuate the visit of the royal family to the "Resolute," Her Majesty the Queen sent her photographer on board the vessel to take the portraits of the officers, who assembled on the quarter-deck for that purpose in full uniform, so that they would appear with the members of the royal family in a beautiful painting to be executed by Mr. Simpson, at the special request of the Queen. The original of this painting is now in Windsor Castle, and from it the copy was taken which was on exhibition in this country some years ago. Engravings were also made from it by Messrs. Colagni, London, who kindly presented me with one on my return home. In this painting is also the likeness of Miss Cathcart, maid of honor to the Queen, renowned for her beauty.

On December 30, 1856, the final transfer of the "Resolute" to Great Britain was effected, an account of which appeared in a Portsmouth paper, and was described so well that I have taken the liberty of quoting from the article, which says "that the event excited considerable interest. The American colors flying side by side with those of England at the peak of the 'Resolute.' Captain Seymour, the flag-captain of Sir George Seymour, the commander-in-chief of the station, represented his government on this interesting occasion on the quarter-deck of the vessel, where Captain Hartstene, officers, and crew were assembled. As the dock-yard clock struck one the flag-ship 'Victory' hoisted the stars and stripes of the United States at her main, and fired a salute of twenty-one guns. Whilst the salute was being fired Captain Hartstene ordered the American colors to be hauled down on board of the 'Resolute,' and the union jack then floated alone. The salute being ended, and the change of colors effected, the crew of the 'Resolute' manned the rigging and gave three hearty cheers as a return for the salute. Captain Hartstene then addressed Captain Seymour: 'Sir, the closing scene of my most pleasant and important mission has now to be performed, and permit me to hope that long after every timber in her sturdy frame shall have perished the remembrance of the old

'Resolute' will be cherished by the people of the respective nations. I now, with a pride totally at variance with our professional ideas, strike my flag, and to you, sir, give up this ship.' Captain Seymour replied: 'I am sure, sir, that this graceful act on the part of the United States towards this country, and the graceful manner in which it has been performed by yourself, sir, and the other officers of the ship, will ever live in the memory of the people of England.'"

This concluded the ceremony of the delivery of the "Resolute" to England, the Queen herself having, it will be remembered, personally received the gift on her visit to the vessel at Cowes. The steamer "Sprightly," commanded by Master Commander George Allen, R.N., who had been in close attendance on the officers and crew,—a duty assigned him by Sir George Seymour,—carried them to Southampton, from which port they took passage for New York in the American merchant steamer "Washington," commanded by Captain Cassidy, formerly a warrant-officer in the United States navy. The final departure from the "Resolute" created considerable emotion on the part of the officers and men who had brought her to England, all of whom appeared to feel they had only performed a work of love and pleasure, which had been most amply requited by the kindness and hospitality with which they had been received in England.

The feelings of the officers of the "Resolute" took expression in a ballad, composed by Dr. Maccoun,[3] an officer of fine literary attainments, and surgeon of the ship, that appears with the official communications at the close of the narrative referring to the "Resolute."

In conclusion, it will not be amiss to allude to a beautiful writing-desk made from the timbers of the "Resolute" by the British Admiralty, and, by express orders of Her Majesty the Queen, to be presented to the President and people of the United States in her name, inscribed on a brass plate inserted in front of the principal drawers, and containing the following inscription:

"H. M. S. 'Resolute,' forming part of the expedition sent in search of Sir John Franklin in 1852, was abandoned in Latitude 74 degrees 41 minutes North, Longitude 101 degrees 22 minutes West, on the 15th of May, 1854. She was discovered and extricated in September, 1855, in Latitude 67 degrees North, by Captain Buddington, of the United States whaler 'George and Henry.' This ship was purchased, fitted out, and sent to England as a gift to Her Majesty Queen Victoria by the President and the people of the United States, as a token of good will and friendship. This table was made from her timbers when

[3] Dr. Maccoun left at Southampton to join the Mediterranean Squadron. Lieutenant C. H. Wells had permission from the Secretary of the Navy to remain abroad for a few weeks, and returned home in the Cunard steamer "Asia," Captain Lott, who, to his surprise, informed him "that he had special instructions to extend to him every comfort, including a free passage to New York."

she was broken up, and is presented by the Queen of Great Britain and Ireland to the President of the United States as a memorial of the courtesy and loving-kindness which dictated the offer of the gift of the 'Resolute.'"

The Queen has also presented to the widow of Henry Grinnell a writing-table made from the same vessel, as a memorial of the disinterested kindness and great exertions of her late husband, Mr. H. Grinnell, in assisting in the search after Sir John Franklin.

The desk sent to the President is now in the White House, and is an object of great interest to the numerous visitors of the President and Mrs. Hayes, by whose directions it is to be placed in the library of the Presidential mansion, awaiting a suitable occasion for a more formal act of presentation, which, I understand, will take place shortly.

It will be noticed that I have given the rank the English officers held at the time they were serving in Arctic expeditions; many of them have since risen to the highest grades in the British navy, while others have died, but their services will never be forgotten that had for their object the rescue of the Sir John Franklin expedition.

THE SHIP "RESOLUTE."

Message from the President of the United States, transmitting copies of a correspondence growing out of the restoration of the ship "Resolute" to Her Britannic Majesty's service, January 20, 1857. Laid upon the table and ordered to be printed.

TO THE SENATE AND HOUSE OF REPRESENTATIVES:

Soon after the close of the last session of Congress I directed steps to be taken to carry into effect the joint resolution of August 28, 1856, relative to the restoration of the ship "Resolute" to Her Britannic Majesty's service. The ship was purchased of the salvors at the sum appropriated for the purpose, and "after being fully repaired and equipped," was sent to England under control of the Secretary of the Navy. The letter from Her Majesty's Minister of Foreign Affairs, now communicated to Congress in conformity with this request, and copies of correspondence from the files of the Departments of State and of the Navy (also transmitted herewith), will apprise you of the manner in which the joint resolution has been fully executed, and show how agreeable the proceeding has been to Her Majesty's government.

(Signed) FRANKLIN PIERCE.

WASHINGTON, January 19, 1857.

RESOLUTIONS.

A Resolution authorizing the purchase and restoration to the British government of the ship "Resolute," late of the British navy.

WHEREAS, It has become known to Congress that the ship "Resolute," late of the navy of Her Majesty the Queen of the United King-

dom of Great Britain and Ireland, on service in the Arctic seas in search of Sir John Franklin and the survivors of the expedition under his command, was rescued and recovered in those seas by the officers and crew of the American whaleship the "George and Henry," after the "Resolute" had been necessarily abandoned in the ice by her officers and crew, and after drifting still in the ice for more than one thousand miles from the place where so abandoned; and that the said ship "Resolute" having been brought to the United States by the salvors at great risk and peril, had been generously relinquished to them by Her Majesty's government: now, in token of the deep interest felt in the United States for the service in which Her Majesty's said ship was engaged when thus necessarily abandoned, and of the sense entertained by Congress of the act of Her Majesty's government in surrendering said ship to the salvors:

Be it resolved by the Senate and House of Representatives of the United States of America, in Congress assembled, That the President of the United States be, and he is hereby requested to cause the said ship "Resolute," with all her armament, equipment, and the property on board when she arrived in the United States, and which has been preserved in good condition, to be purchased of her present owners, and that he send the said ship, with everything pertaining to her as aforesaid, after being fully repaired and equipped at one of the navy-yards of the United States, back to England under control of the Secretary of the Navy, with a request to Her Majesty's government that the United States may be allowed to restore the said ship "Resolute" to Her Majesty's service; and for the purchase of the said ship and her appurtenances as aforesaid the sum of forty thousand dollars, or so much thereof as may be required, is hereby appropriated, to be paid out of any money in the treasury not otherwise appropriated.

Approved August 28, 1856.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
September 13, 1856.

SIR,—The Department has given instructions that when the bark "Resolute" is received at the yard under your command she will be refitted in such a perfect and complete manner that she may be returned to the British government in all respects equal to any vessel fitted for the United States navy, and, if possible, even superior to that in which she may have originally left a British dock-yard.

You will please instruct Commander Hartstene and Mr. Delano, the naval constructor, to make a full examination, and report upon the condition of the vessel and all her equipments, stating the repairs they consider it necessary to have done, which, in as far as you concur, you will at once proceed to execute, transmitting the report, with your own views, to the Bureau.

As the dry-dock is at present occupied by the "Mississippi," you will take the vessel up at the proper time on any of the private docks in New York that may be most suitable. The wish of the Department being that the vessel be completed with great promptness, you will please commence it without delay on the masts, rigging, sails, boats, casks, etc., as well as on the hull.

You will please request the naval constructor to make a report on the manner in which the hull was prepared and strengthened, as the object in fitting the "Resolute" was the same as in the "Release," executed at the yard under your command.

Very respectfully, your obedient servant,

(Signed) JOHN LENTHALL,
Chief of Bureau.

CAPTAIN A. BIGELOW, U.S.N.,
Commandant Navy-Yard, New York.

MR. MARCY TO MR. DALLAS.

DEPARTMENT OF STATE, WASHINGTON,
November 5, 1856.

SIR,—I have heretofore advised you of the resolution of Congress, passed on the 28th day of August last, requesting the President to cause the ship "Resolute," formerly belonging to the royal navy of Great Britain, which had been abandoned in the Arctic region, and afterwards saved by the crew of the "George and Henry," an American whale-ship, to be purchased by the United States, fitted up, and sent back to England, under the control of the Secretary of the Navy, with a request to Her Majesty's government that the United States may be allowed to restore it to Her Majesty's service.

All that the resolution requires has been done except the presentation of the vessel to the acceptance of the government of Great Britain. A crew has been detailed, and the ship placed under the command of Commander Hartstene for the purpose of being taken to England. He is ordered to take her to the port of Portsmouth.

As soon as Commander Hartstene arrives with the "Resolute" he will notify you of that fact, and you will thereupon communicate to the British government the object for which that vessel has been sent to England, and tender her to Her Majesty's government, in fulfillment of the provisions of the resolution of Congress, with the assurance of the President's sincere gratification in performing such an act of comity to a friendly power.

Commander Hartstene will have orders from the Navy Department to conform to any directions you may have occasion to give him for delivering the vessel to Her Majesty's government.

With this dispatch I send you a copy of the resolution of Congress, as you may have occasion to use one in communicating with the British government on the subject.

I am, etc.,

W. L. MARCY.

U. S. NAVY DEPARTMENT,
WASHINGTON, 8th November, 1856.

TO THE RIGHT HON. SIR CHARLES WOOD, C.B.,
First Lord of H. B. M.'s Admiralty.

SIR,—This communication will be delivered to you by Commander Henry J. Hartstene, of the United States navy, who goes to England in command of the "Resolute," under orders from his government, with a view to carrying into execution "A resolution authorizing the purchase and restoration to the British government of the ship 'Resolute,' late of the British navy," a copy of which I have the honor to inclose herewith. The language of the preamble and the resolution so distinctly announces the considerations which prompted their adoption and approval as to dispense with their repetition and recital on my part. This very agreeable duty is performed by me, sir, with much pleasure.

The ship has been thoroughly repaired, and has on board "all her armament, equipment, and property" which had been preserved in good condition. In pursuance of the resolution, the President requests Her Majesty's government to allow him to restore the ship "Resolute" to Her Majesty's service.

Commander Hartstene is ordered to deliver the vessel at any port and to any officer to be designated at the pleasure of Her Majesty's government.

Accept assurances of high respect, etc.

(Signed) J. C. DOBBIN,
Secretary of the Navy.

ADMIRALTY, December 12, 1856.

SIR,—I have this moment heard by telegraph that the "Resolute," which the government of the United States has in a manner so gratifying to the feelings of this country sent over under your command, is entering Portsmouth. I hasten to assure you of the satisfaction with which I have learnt your arrival in this country, and of my anxiety to offer to yourself, your officers, and crew the warmest reception in my power. Captain Sir Thomas Maitland, the senior officer at Portsmouth, in the accidental absence of the two admirals, will, I am assured, do everything in his power to show the spirit in which we are most anxious that you should be welcomed; and when we are apprised of your wishes and intentions as to your stay in this country and return to America, we shall be happy to meet them to the utmost.

This is not a fitting opportunity for saying anything as to the munificent conduct of your government, which will be the subject of communications between the governments of our respective countries. I am wishful at present to offer to yourself and your companions, personally, every civility and courtesy that the Board of Admiralty can command. I have the honor to be, sir,

Your obedient and faithful servant,

(Signed) CHARLES WOOD.

CAPTAIN HARTSTENE.

NAVY DEPARTMENT, November 8, 1856.

SIR,—The Department has placed you in command of the "Resolute," recently fully repaired and fitted out by the United States with a view of her restoration to the British government, in pursuance of a joint resolution of Congress, approved August 28, 1856.

You will, so soon as she is in all respects ready for sea, proceed to England, entering the port of Portsmouth; leaving her there in charge of the officers under your command, you will proceed immediately to London, in order to advise with the American minister, Honorable George M. Dallas, to whom you will deliver the inclosed dispatch from the Department of State. Accompanying these instructions, you will receive an open communication from this Department to Sir Charles Wood, the First Lord of the Admiralty, who will, I presume, advise you as to the proper disposition of the ship in the event of Her Majesty's government accepting her. You will consult freely with Mr. Dallas, and find it convenient to be guided in your movements by suggestions from one so peculiarly competent as he is.

When you have performed the duty assigned to you, you will make arrangements for the return of the officers and men, exercising all prudence and economy.

Previous dispatches have instructed you as to the mode of procuring funds to effect your purposes.

I am, respectfully, your obedient servant,

(Signed) J. C. DOBBIN.

COMMANDER HENRY J. HARTSTENE, U. S. Navy,
Commanding Bark "Resolute," New York.

LONDON, December 19, 1856.

SIR,—I have the honor to inform you that after a boisterous passage we anchored at Spithead on the 12th instant, at half-past two o'clock P.M., with the United States and British ensigns flying at the peak. Notwithstanding the previous gale, which was then raging, we were immediately boarded by Captain Peel, of H. B. M. frigate "Shannon," who cordially offered to us every civility and attention. In a few

moments afterwards a steamer arrived from Vice-Admiral Sir George Seymour (Commander), officer of the station, with a tender of services and congratulations upon our safe arrival. Proceeding to Portsmouth the next morning (which I did in a government steamer provided me for that purpose), I visited the U. S. consulate, and was there waited upon by Sir Thomas Maitland (who had become commanding officer of the naval station in the absence of the admiral, Sir George Seymour), and received from him a most cordial welcome, with proffers of every possible service by express instruction from the Admiralty. Accommodations were prepared for us at the first hotel, and orders for a bountiful supply of provisions to be sent on board the "Resolute." Also a *carte-blanche* for the railroad to London for myself and the officers of the "Resolute." In fact, nothing could exceed the kindness and courtesy with which we were treated by Captain Sir Thomas Maitland, who seemed unwilling that any means of adding to his hearty expressions of welcome should pass unexhausted. That morning's post brought me a communication from Sir Charles Wood (First Lord of the Admiralty, which I herewith inclose), whose expressions of kindly feeling I beg may be particularly noticed. At noon of the day after our arrival a royal salute was fired from the "Victory" (flag-ship), from the fortifications, and from the "Shannon," at Spithead. As soon as my official visits were made I proceeded to London, and delivered to the Honorable Mr. Dallas, minister plenipotentiary and envoy extraordinary from the United States, the open communications committed to my charge by the Department. In London as well as in Portsmouth I received the most cordial and pressing hospitalities. In fact, scarcely an hour has elapsed without a proffer of courtesy and hospitality from municipal corporations, military authorities, scientific associations, clubs, etc., all of which I have politely declined, except an invitation to dine with Lord Palmerston; also one from Admiral Sir George Seymour, and one from the municipal authorities of Portsmouth. Her Majesty the Queen expressing a wish to visit the "Resolute," and a desire that that vessel might be taken to Cowes (near Her Majesty's private palace), I immediately acceded, and the ship was towed thither by a government steamer, escorted by two other steamers and H. B. M. steam-frigate "Retribution." On the morning of the 16th, at ten o'clock, Her Majesty the Queen, accompanied by His Royal Highness Prince Albert (with the Prince of Wales, Princess Royal, Princess Alice, and several members of the royal household), visited the "Resolute." She was received with all honors. As Her Majesty stepped on board, after being presented by Vice-Admiral Sir George Seymour, K.C.B., I welcomed her, and from the impulse of the moment, and in obedience to what I conceived to be the feelings of my countrymen, I delivered the "Resolute" to Her Majesty, after which I showed Her Majesty all the objects of interest connected with the vessel, with which she appeared much

gratified. On the afternoon of the same day I received from the Honorable C. B. Phipps, C.B., Keeper of H. B. M.'s Privy Purse, a note inclosing the check for £100 (one hundred pounds), with a request from Her Majesty that it should be distributed among the crew, which I accepted in their behalf. I inclose the note, also a letter from Admiral Sir George Seymour, K.C.B. By favor of an invitation from Her Majesty the Queen, I dined and spent the night at the palace of Her Majesty at Osborne, where I was treated with the most distinguished attention. On the following morning (December 17) the "Resolute" was towed up to the harbor of Portsmouth, escorted by H. B. M. steam-frigate "Retribution," and on arriving at her anchorage was received by another royal salute and with such an outburst of popular feeling as was never known before.

I have this day received from Sir Charles Wood, First Lord of the Admiralty, an invitation herewith inclosed, which could not be declined. I have therefore accepted it, and shall, as soon as is agreeable to H. B. M.'s government, deliver up the "Resolute" and take advantage of their courteous tender of a passage to the United States.

Respectfully,

(Signed) H. J. HARTSTENE,
Commander U.S.N.

TO THE HON. J. C. DOBBIN,
Secretary U. S. Navy, Washington, D. C.

NAVY DEPARTMENT, January 28, 1857.

COMMANDER J. H. HARTSTENE, U.S.N., New York.

SIR,—I congratulate you, your officers, and men on your safe return home after a successful and satisfactory accomplishment of the duty assigned to you.

Your correspondence and reports were submitted to the President, and it will no doubt be gratifying to you to know that he concurs with the Department in approving your course. The incidents connected with the execution of the joint resolutions lend them additional force and propriety. The expenditures to which you were subjected I trust will be allowed by Congress. You will make known to the officers the great satisfaction expressed by the Department at hearing from the best sources of their excellent bearing in co-operating with you.

I am, respectfully, your obedient servant,

(Signed) J. C. DOBBIN,
Secretary of the Navy.

THE EARL OF CLARENDON TO MR. DALLAS.

FOREIGN OFFICE, December 16, 1856.

SIR,—I have the honor to acknowledge the receipt of your letter of the 13th inst., announcing to me the arrival of the bark "Resolute" at Portsmouth, under the command of Captain Hartstene, of the United

States navy. That vessel, after having been unavoidably abandoned in the ice, while employed in the service of Her Majesty, on an expedition in the Arctic seas in search of Sir John Franklin, was discovered two years afterwards adrift more than twelve hundred miles from the place where she was abandoned, and was taken to the United States by some American seamen, in whose favor Her Majesty's government relinquished all claim to the ship. Under these circumstances the Senate and House of Representatives of the United States by a joint resolution, of which you transmit to me a certified copy, authorized the President of the United States to purchase the "Resolute" of her salvors, with all her armament, equipment, and the property on board of her when she arrived in the United States, and to cause the ship, with everything belonging to her, after being fully repaired at one of the navy-yards of the United States, to be sent back to England, in order to be restored to Her Majesty's service, as a testimony of the deep interest felt in the United States for the service in which the ship was engaged when she was necessarily abandoned.

I have not failed to lay your letter and its inclosures before the Queen, and I have received Her Majesty's commands to acquaint you that she gratefully accepts the offer thus made of the restoration of the "Resolute" to her service. I beg to assure you that the friendly feeling on the part of the Senate and House of Representatives which prompted this measure, and the generous and complete manner in which it has been carried into effect by the President and his government, are most highly appreciated by the Queen and Her Majesty's government, and, I am confident, by the British nation at large.

I request you, sir, to have the goodness to convey to the President, and to request him to communicate to the legislature of the United States, the cordial thanks of the Queen and of the British government for an act of generosity and sympathy which will meet with a warm response in this country, and cannot fail to strengthen the kindly feelings which unite the people and governments of the two nations.

I beg to add that the Queen has signified her intention to visit the "Resolute" off Cowes on this day, in recognition of the munificence of the legislature and government of the United States in restoring that vessel to Her Majesty's service, and in compliment to the officers and crew who have brought her to this country.

I avail myself of this opportunity to renew to you the assurances of the highest consideration with which I have the honor to be, sir,

Your most obedient, humble servant,

(Signed) CLARENDON.

THE RESOLUTE.

A BALLAD.

Far in the regions of the North,
'Mid chilly icebergs bound,
Full many a wint'ry moon I laid,
The wild winds whistling round.

My wooden walls were tenantless;
No more the busy throng
Cheer'd my lone decks, through Arctic nights,
With music[4] and with song.

The bold and gallant crew had fled
That once I gladly bore
In search of Franklin and his men
From Albion's happy shore;

And there, amidst those frozen seas,
Amidst that awful gloom,
Methought 'twould be my lot to find
A solitary tomb.

But one bright morn, o'er icy peaks,
I saw the genial sun,
Spreading the joyful news around—
That summer had begun.

Soon the loud crash of falling bergs
Bespoke the rapid thaw;
And all around the melting ice
Each day, each hour, I saw.

Then from the chambers of the North
A fearful gale there blew;
And set afloat without a sail,
O'er the wild waves I flew.

Twelve hundred miles I floated on,—
Now drifting with the tide,
Now forced before the angry storm,
Without a hand to guide,—

[4] A hand-organ and a large musical box were found on board the "Resolute" when picked up off Cape Mercy.

When lo, across the foaming main,
A vessel hove in view!
She launch'd her boats upon the waves,
Manned by a gallant crew.

They sprang on deck, unloos'd my sails,
And 'neath their guardian hand
I blithely plough'd the wat'ry waste
Toward a genial land.

There, anchor'd in a tranquil port,
My friends no want denied;
Each bruise was dress'd, each wound was heal'd,
And ev'ry need supplied;

My tap'ring masts were rear'd aloft
As proudly as of yore,
And through my frame I felt the power
To brave the deep once more.

It was a bright, a happy land
I saw far o'er the wave,
Peopled with men like Englishmen,—
As proud, as bold, as brave.

And oft I heard those good folks speak,
Dear Albion, of thee,
And bless their lot that they had sprung
From such a parent tree.

A gallant crew was sent on board,
A noble captain, too,
With officers of goodly fame,
Whose hearts were stanch and true.

My capstan merrily went round,
My anchor was aweigh,
My sails were loosen'd to the breeze,—
Yet ere I sped away,

Amid three long and lusty cheers,
Which my bold tars repaid,
Columbia, daughter of the West,
In tones of kindness said:

"Go! gallant bark, from danger sure,
Across th' Atlantic sea,
Token to England's gracious Queen
Of kind fraternity.

"Go! and proclaim through Britain's isle,
From whence our fathers came,
That her descendants cherish yet
Her venerable name.

"And may two lands, so near allied
By language and by blood,
So closely join'd by stately ships
That cross the mighty flood,—

"And soon by Science to be brought
By slender bands so near,
That ev'ry pulse that thrills through thee
Shall beat responsive here,—

"Forever guard with sacred care
The ties of parentage,
And, bound by love and mutual weal,
Prosper from age to age."

Thus spake the Maid, and forth I sped
Across the stormy sea,
Freighted with many a friendly word,
My native land, for thee.

And when my good and gracious Queen
The wond'rous tale shall learn
Of all the dangers I have seen
And of my safe return,

She'll join with ev'ry Englishman,
Of high and low degree,
To thank our cousins for this pledge
Of kind fraternity. R. T. M.

In the preparation of this article I desire to convey my acknowledgments to the Honorable R. W. Thompson, Secretary of the Navy; John W. Hogg, Chief Clerk of the Navy Department; Hugh Allen Goldsborough, Chief Clerk of Bureau of Construction and Repair; Dr. Walter S. McNairy, Navy Department; and Mr. A. A. Adee, of the State Department, for their kindness in giving me access to official letters bearing upon the "Resolute."

C. H. WELLS,
Commodore, and Chief Signal Officer U. S. Navy.

THE ORGANIZATION AND EMPLOYMENT OF THE GERMAN ARTILLERY.

BAVARIA.

WHILE the armies of Saxony and Würtemberg are under the German Emperor both in peace and war, the army of Bavaria is placed under his orders only in time of war.

The Bavarian army forms the Sixteenth and Seventeenth Army Corps, for which there are two corresponding army corps districts.

Each army corps has one field artillery brigade, and there are besides in Bavaria one foot artillery brigade, a technical division, and institutions.

In reference to tactics and discipline, the artillery troops are under the authority of the general commanding, but in regard to artillery affairs they are placed under the inspection of artillery and trains, except the musket-factories, which are managed directly from the War Ministry.

Field Artillery.

The inspection of artillery and trains is composed of one lieutenant-general, or major-general, as inspector; one field-officer, who reports in reference to train affairs; one captain or one lieutenant, adjutant; one registrater, one servant, ten horses. Total, four officers, two men, ten horses.

A field artillery brigade is formed of a staff and two field artillery regiments. The composition of the brigade is the same as in Prussia.

In War.

As in the other German states, ammunition divisions, depots, and reserve batteries are formed, and after the Prussian model already explained. The two brigades number together 34 batteries, with 204 guns, 4 ammunition divisions of 20 ammunition columns, and there are besides 8 depot batteries and 6 reserve batteries. Total, 44 batteries, of 264 guns.

---

[1] Continued from January number.

The total strength of a brigade is 136 officers, 8 surgeons, 4540 men, 4480 horses, 102 guns, and 451 wagons.

The strength of a Bavarian army corps is (*a*) 59,300 infantry and rifles (Jägers); (*b*) 65,600 infantry, rifles, and cavalry, and 102 guns.

It follows, therefore, that the proportion of artillery is: (*a*) to 1000 men 3.44 guns, or 1 gun to 290 men (in Prussia 1 to 260); (*b*) to 1000 men 3.11 guns, or 1 gun to 321 men (in Prussia 1 gun to 292 men).

Foot Artillery.

The foot artillery brigade is formed of two regiments, and, like the field artillery brigades, is under the inspection of artillery and trains, and in respect to artillery duties is in no wise connected with the army corps. The headquarters of the brigade are in Munich, and the staff consists of one major-general or colonel; one lieutenant, adjutant; one ordnance store-keeper, captain; one master-artificer, captain; two ordnance store-keepers, sergeants. Total, four officers, two men.

The field artillery brigade commander is also the head of the artillery advisory commission, and the brigade staff constitutes a territorial authority for the equipment and management of the fortresses, and the superintendent of the fortress artillery depots, those in open cities, and the several artillery officers de place are under its authority.

Each foot artillery regiment consists of a staff, two battalions of four companies each. In regard to its depot and mobilization, the First Foot Artillery Regiment is immediately under the order of the corps staff, and the Second Regiment under the staff of the other corps.

The following table gives the peace strength of the Bavarian foot artillery:

	Regiments.	Battalions.	Companies.	General.	Field-Officers.	Captains.	First Lieutenants.	Second Lieutenants.	Surgeons.	Sergeant-Majors.	Ensigns.	Non.-Com. Officers.	Paymasters.	Upper Lance Corporals.	Lance Corporals.	Cannoneers.	Military Tradesmen.	General.	Officers.	Surgeons.	Men.	Total.	Horses.
Regimental staff	...	...	...	...	1	...	...	5	2	...	...	2	...	.....	.....	.....	...	...	6	2	2	10	4
Battalion staff	...	...	...	...	1	...	...	1	...	...	...	1	2	.....	.....	.....	...	...	2	...	3	5	3
One company	...	...	...	...	...	1	1	2	...	1	1	16	...	10	13	77	3	...	4	...	121	125	4
Total of brigade	2	4	16	1	6	18	17	26	4	16	16	266	8	160	208	1232	48	1	87	4	1954	204	684

War Formation.

The foot artillery is increased to thirty-two companies by calling in the reserve and landwehr as in Prussia, and the *personnel* then is 1

general, 12 field-officers, 34 captains, 151 lieutenants, 16 surgeons, 6695 men.

Reserve Establishments.

The artillery reserve establishment is the siege part, which consists of one hundred breech-loading Prussian guns and forty smooth-bore mortars. The material for the park is deposited partly in Munich and partly in the fortresses of the South German states, to which it in a measure belongs.

To the technical part of the artillery belong: 1, the small-arms factory; 2, the arsenal; 3, the workshops; 4, the laboratories; 5, the powder-mills; 6, the cannon-foundry; 7, the projectile-factory; 8, the artillery depots; 9, the company of workmen; 10, the laboratory company.

1. The small-arms factory is located at Amberg, and is managed by a "direction," which is individually responsible to the War Ministry. The direction consists of one colonel, two captains, three clerks, and three non-commissioned officers.

2. The arsenal at Munich is placed under the "inspection of artillery and marines"; it is the chief arms and munition depot of the Bavarian army. The arsenal "direction" consists of one major-general, two field-officers, four officers, four overseers, six civilians, two clerks, one orderly.

Under this direction are also placed the artillery workshops (3), where the company of workmen is employed; the laboratories (4), where the laboratory company is located; (5), the powder-mills at Ingolstadt and the cannon-foundry at Augsburg. There is a captain at the head of the powder-mills, with a lieutenant as assistant. A field-officer superintends the cannon-foundry (6), with a captain and three civil officers to assist. The projectile-factory (7) is at Ingolstadt. The artillery depots (8) are in the fortresses of Ingolstadt, Munich, Germersheim, Augsburg, Nuremberg, and Wurzburg. The artillery depots in the fortresses have superintendents. Those in the open towns are under the supervision of an artillery "officer de place," and all these officers, in regard to the management of the depots, are under the authority of the foot artillery brigade staff.

The company of workmen (9) consists of one captain, two lieutenants, one paymaster, seventeen non-commissioned officers, ninety-seven workmen of the first, second, and third classes. Total, three officers and one hundred and eighteen men.

The laboratory company (10) is composed of one captain, two lieutenants, one paymaster, six artificer-sergeants, eight non-commissioned officers, six upper lance corporals, twelve lance corporals, fifty cannoneers, five military tradesmen. Total, three officers, eighty-eight men. Both companies are under the arsenal direction.

The Artillery Commission.

This is located in Munich, and is composed of the commander of the foot artillery brigade as chief, two field-officers, four captains, four ordnance store sergeants.

The commission is subordinate to the inspection of artillery and trains. It is the duty of the commission to conduct experiments, make recommendations in regard to the service and instruction of the artillery troops, and the perfection of the material.

The Artillery and Engineer School.

This institution is situated in Munich, and is designed for the special training of lieutenants of artillery and engineers in the scientific and practical duties of their respective arms. The course of instruction lasts two years, and the studies and exercises are similar to those of the United Artillery and Engineer School, Prussia. The staff of the school consists of one field-officer as director, four officers (instructors), one drawing-master. The school is under the supervision of the artillery commission at Munich.

Arms and Equipments.

The Bavarian artillery is armed and equipped like the Prussian.

Saxony.

The troops of Saxony form the Twelfth Army Corps of the German army. The field artillery of Saxony consists of one artillery brigade, which, as in Prussia, belongs to the army corps. The foot artillery is comprised in one regiment. The highest artillery authority is the artillery committee, which is composed of the commander of the field artillery brigade, president, the chief of the division of technical affairs of War Department, the colonels of the Third Artillery Regiments, the director of the artillery workshops, manufactures, etc., the sub-chief of the general staff.

The Saxon field artillery is not placed under the Prussian field artillery inspections; on the contrary, the Saxon foot artillery regiment is controlled through the Fourth Prussian Foot Artillery Brigade, which is under the Second Foot Artillery inspection.

Peace Formation.

The field artillery brigade consists of a staff, the Twelfth Field Artillery Regiment for the "corps" artillery, and the Twenty-eighth Field

Artillery Regiment for the "divisional" artillery. They are organized as in Prussia, the batteries having but four guns horsed.

In War.

The organization remains the same as in peace, except that each of the field artillery regiments forms one ammunition division of five munition columns, one depot division, one tradesmen division, and the regiment of corps artillery, the divisional regiment, two reserve batteries. All the batteries have six guns.

The following table gives the total war strength of the field artillery:

Designation.	Regiments.	Divisions.	Batteries.		Munition Columns.	General.	Total Aggregate.				Horses.		Guns.	Munition-Wagons.	Store-Wagons.	Forges.	Train-Wagons.	Total.
			Mounted.	Horse.			Officers.	Medical Officers.	Veterinaries.	Men.	Officers.	Men.	Riding.	Draught.						
Field artillery brigade...	2	5	16	2	10	1	147	18	18	4706	148	4742	836	3681	108	306	64	28	62	568
Two depot divisions, including tradesmen division	...	2	4	.....	...	...	22	2	2	560	22	564	.....	318	24	.....	...	...	...	24
Three reserve batteries...	...	...	3	.....	...	...	12	...	...	492	12	492	87	324	18	18	9	3	3	51
Total.....	2	7	23	2	10	1	181	20	20	5758	182	5798	923	4323	150	324	73	31	65	643

The proportion of men to guns in the Twelfth Saxon Corps is therefore as follows: (*a*) infantry and jägers, 29,700 men; (*b*) infantry, jägers, and cavalry, 33,400 men; number of guns, 108. In the first case (*a*) to 1000 men 3.63 guns, or 1 gun to 275 men (in Prussia 1 to 260 men); (*b*) to 1000 men 3.23 guns, or 1 gun to 309 men (in Prussia 1 to 292 men).

The regiment of foot artillery consists in time of peace of two battalions of four companies each. In time of war the number of battalions is increased to four and the number of companies to sixteen, as in Prussia. This gives a total of 6 field-officers, 91 captains and lieutenants, 8 medical officers, 3347 men.

The arms and equipments of the Saxon artillery are the same as for the Prussian. The artillery workshops, etc., are located in Dresden. They are under a director, and manufacture all the necessary equipments and munitions for the artillery.

Würtemberg.

The troops of Würtemberg form the Thirteenth Army Corps of the German army. To this corps belong the Thirteenth Würtemberg

Field Artillery Brigade and one foot artillery battalion. The artillery of Würtemberg is independent of the Prussian artillery inspections.

Peace Formation.

The Thirteenth Field Artillery Brigade consists of two regiments (Nos. 13 and 29), of which the Thirteenth is the corps artillery, and the Twenty-ninth the artillery of the infantry divisions. The corps regiment has two divisions of three batteries, the divisional regiment two divisions of four batteries, with the following composition: 1 general, 8 field-officers, 71 officers, 8 medical officers, 1478 men, 254 riding horses, 420 draught horses, 56 guns. Total, 80 officers, 1486 men, 674 horses, 56 guns.

In War.

The field artillery brigade has two ammunition divisions added, of five columns each, besides one depot division, three depot batteries, one tradesmen division, and three reserve batteries, with the following strength: 123 officers, 4074 men, 3826 horses, 84 guns, 416 ammunition-wagons.

The depot division, including the tradesmen division, is composed of 15 officers, 650 men, 225 horses, 18 guns, and the three reserve batteries of 12 officers, 492 men, 411 horses, 18 guns, and 33 munition-wagons.

The total artillery war contingent of Würtemberg field artillery is, therefore, 150 officers, 5216 men, 4462 horses, 120 guns, and 449 wagons.

The Würtemberg army corps numbers (*a*) 24,500 infantry; (*b*) 26,800 infantry and cavalry; 84 guns.

The proportion of artillery to the other arms is thus: (*a*) to 1000 men 3.43 guns (in Prussia 3.84), or 1 gun to 291 men (in Prussia to 260 men); (*b*) to 1000 men 3.13 guns, or 1 gun to 319 men (in Prussia 1 gun to 292 men).

Foot Artillery.

In time of peace the foot artillery consists of one battalion of four companies. In time of war, by calling in the reserves and landwehr, a corresponding landwehr foot artillery battalion is formed. The peace strength is 27 officers, 417 men, 7 horses; the war strength, 44 officers, 1642 men, 14 horses.

Arms and Equipment.

Same as in Prussia.

The Technical Establishment.

The artillery stores, guns, and equipments, not in the hands of the troops, are stored at Ludwigsburg, where there are also repair-shops. The manufactories of Prussia supply the Würtemberg artillery.

TABLE SHOWING THE WAR STRENGTH OF THE GERMAN ARTILLERY.

Designation.	Field Artillery.														Foot Artillery.					
	Brigades.	Regiments.	Divisions.	Batteries. 8 cm.	Batteries. 9 cm.	Batteries. Horse.	Depot Divisions.	Depot Batteries.	Reserve Batteries.	Ammunition Division.	Ammunition Column.	Men.	Horses.	Guns.	Brigades.	Regiments.	Battalions.	Companies.	Men.	Horses.
Prussia.																				
Field artillery	13	28	68	...	196	38	...	...	...	28	140	64,509	63,460	1,404	...	...	...	.....	.....	...
Foot, depot, and reserve artillery	...	...	...	...	.....	...	28	56	42	...	.....	20,494	10,263	588	4	10	44	176	38,024	...
Saxony.																				
Field artillery	1	2	5	...	16	2	...	...	...	2	10	4,890	4,517	108	...	...	...	.....	.....	...
Foot, depot, and reserve artillery	...	...	...	...	.....	...	2	4	3	...	.....	1,090	729	42	...	1	4	16	3,452	...
Würtemberg.																				
Field artillery	1	2	4	7	7	...	...	...	...	2	10	4,193	3,826	84	...	...	...	.....	.....	...
Foot, depot, and reserve artillery	...	...	...	...	.....	...	1	3	3	...	.....	1,169	636	36	...	...	2	8	1,686	...
Bavaria.																				
Field artillery.	2	4	10	8	20	6	...	...	...	4	20	9,368	8,970	204	...	...	...	.....	.....	...
Foot, depot, and reserve artillery	...	...	...	...	.....	...	4	8	6	...	.....	2,180	1,458	84	1	2	8	32	6,909	...
Total.																				
Field artillery	17	36	87	15	239	46	...	...	...	...	.....	83,160	80,773	1,800	...	...	...	.....	.....	...
Foot, depot, and reserve artillery	...	...	...	...	.....	...	35	71	54	36	180	24,933	13,091	750	5	13	58	232	.....	...
Total	17	36	87	15	239	46	35	71	54	36	180	107,893	93,864	2,550	5	13	58	232	50,071	...

When mobilization is ordered, the Prussian field battery of instruction is increased to war strength, and becomes a reserve battery.

Instruction of the Artillery.

For the purpose of regular instruction the year is divided into five periods:

First period, from October 1 to January 1.

Second period, from January 1 to April 1.

Third period, from April 1 to the commencement of target practice.

Fourth period, target practice.

Fifth period, from end of target practice to October 1.

Field Artillery.

The annual contingents of recruits and horses join immediately after the autumn manœuvres in September, and in the field artillery

the first two periods, viz., from October 1 to April 1, are set apart for the instruction of the newly-enlisted drivers and cannoneers and remount horses, so that in case of emergency they shall be effective for field service. His instruction includes the sabre exercise and manual of the piece, riding, driving, etc., so that at the end of the second period the new levies are ready to take part in the battery drills. In the third period the battery manœuvres take place, including the passage of obstacles, such as fords, ditches, etc., estimating distances, posting the guns in various positions, providing make-shifts for broken carriages and wagons, transporting disabled guns, making fascines and gabions, and in long-practice marches of not less than three miles.

At least three times during this period the battery is put on a war footing; from nine to twelve wagons of an ammunition division column of each regiment are equipped and a practice march made of not more than two miles. In selecting the wagons, different ones are taken each year in order to equalize wear and tear, as well as to test their condition for service.

In the fourth period[2] the annual target practice takes place, and as late in the year as possible. The principle observed in dividing the time set apart for target practice is to regulate it so that the men will not become wearied, and will, therefore, derive the greatest possible benefit. To insure this, the least firing necessary to accomplish the practice takes place each day.

All the time set apart for instruction in target practice must be chiefly devoted to that purpose; other exercises are not forbidden, but they must be conducted so as not to interfere with this the chief object.

The duration of the firing of each regiment is three weeks, of which each battery has about thirteen days' actual practice (three Sundays and four other days being deducted for other exercises). The distribution of ammunition is regulated by the colonels of the regiments. The practice commences with elementary instruction in firing, for which purpose sixteen unfilled shells, eight shells, four shrapnel, and four canister are allowed; total, thirty-two rounds.

The practice requires one day. Thereafter follows further elementary instruction, principally for the purpose of teaching the loading, and is especially for the benefit of the enlisted men. This requires four days, and seventy-six filled shells and thirty-two shrapnel are allowed; total, one hundred and eight rounds. As a third exercise follows the "battle firing," in which are expended sixty-four filled shells, thirty-two shrapnel, and eight canister; total, one hundred and four rounds; and this practice continues for three days.

[2] This practice takes place at the polygon or firing school of the army corps. For an account of these schools, see Vol. I., No. 4, *Journal of Military Service Institution*, article on "The Italian Artillery."

The firing is conducted as in battle; the distances, being unknown, are estimated by the eye or by a range-finder. The result of the firing is not made public until the conclusion of each practice and after a critical examination of the entire firing has been made by the battery and division commander.

Battle firing of the battery divisions and regiments takes place as prescribed for the batteries, and two days are set apart for the practice. Each battery fires thirty-six shells, twenty shrapnel, and four canister; total, sixty rounds.

To test the skill of each battery competitive practice takes place before officers of higher rank than either the battery division or regimental commanders. Finally, a trial to determine the best gunner among the enlisted men. In the former twenty-four shells and twenty-four shrapnel, and in the latter practice twenty unfilled shells, are fired; total, sixty-eight rounds. In the battle firing the incidents of the battle-field are to be imitated as nearly as possible; the targets, made to represent the combatants, are placed at unknown points, or are made to appear suddenly in one direction while a battery is engaged firing in another. The examination and use of the ground becomes one of the most important features of battle firing. The greatest possible attention is given the estimation of distances and target practice, upon which so much of the efficiency of the field artillery depends. Both officers and men go out daily for judging-distance drill, and by means of suitable targets are soon made familiar with the appearance of horses, men, guns, etc., at all distances within which the fire of artillery is effective. The total number of rounds expended by each field battery during the annual target practice is two hundred and forty-four shells, one hundred and twelve shrapnel, sixteen canister; total, three hundred and seventy-two rounds. In the fifth period the autumn manœuvres take place, in which all the artillery takes part, as do the other arms.

Foot Artillery.

As in the field artillery, the instruction is given in five periods. In the first period the foot movements are commenced, the manual of the musket and of the various pieces, the nomenclature and object of the various slopes, lines, etc., of a fortification.

In the second period the foregoing instruction is completed, and the attack and defense of a bastion front in a so-called exercise bastion.

In the third period the estimation of distances, drill of the companies with all kinds of cannon, discussion of the different firings in order to determine the most suitable, having in view the distance and location of the object, preparations of warlike munitions, arming and disarming batteries and forts, employment of rolling-bombs and hand-grenades, preparation of materials for building batteries.

In the fourth period, target practice with all the different pieces, and as prescribed for the field artillery.

In the fifth period a more extended practice takes place of all the garrisons in the fortress service, and as far as possible everything is assimilated to a state of war. The remaining time is employed in reviewing previous instruction. The special and general education of the officers, "aspiranten," non-commissioned officers, and men is conducted as prescribed for the field artillery.

Instruction of the Officers.

From the 1st of October to the 1st of March the improvement of the officers is advanced by study, recitations, and discussions. Every winter there is a criticism of a combat, a grand battle, and a siege for each officer. Tactical examples are given out, which they are required to elaborate and finish.

Problems in the game of war, as heretofore explained, form part of the winter's course. In the spring the officers of the field artillery are instructed in driving by the commander of the battery division; from eight to twelve exercises are usually sufficient.

In winter all the officers ride daily under the direction of a senior captain, and the lieutenants receive instruction in fencing. The practical instruction of the officer aspiranten is usually given in one of the horse-batteries at regimental headquarters. Before going to the war-school they are distributed to the fortress companies, where they remain four weeks and learn the nomenclature of the guns, carriages, etc., as well as the service of the piece.

The One-Year Volunteers. (*Die Einjährig Freiwilligen.*)

In Prussia the entire male population between seventeen and forty-two years of age, with a few unimportant exceptions, is liable to service in the army or navy, and in the case of soldiers seven years of this time must be passed in the active army (three years with the colors and four in the reserve) and five years in the landwehr. Although liability commences at the age of seventeen, conscripts are not usually called for service before the age of twenty. One-year volunteers, as the name signifies, are those who, instead of waiting to be drawn at the annual conscription, volunteer to serve one year in the active army, at the expiration of which they pass into the reserve and are exempted from further service, except in the event of mobilization. This privilege—for as such it is regarded—is only extended to young men between seventeen and twenty years of age, of unexceptionable character, good education, and with sufficient means to defray the entire expense of the year's service, arms and munitions excepted. To enter the service they

apply to appear before the examining committee of the army corps district in which they reside, transmitting with the application the following documents: 1, certificate of baptism; 2, consent of parents or guardian; 3, certificate of moral character; 4, certificate of necessary educational qualification from a gymnasium (college) or polytechnic school, or of one year's service at the cadet school Berlin, or of having completed the course in the first or second division of the cadet school Dresden. A special examination before the committee, based on the curriculum of the colleges or schools, if satisfactory, will be evidence of the necessary literary attainments. On receiving this certificate from the examining committee, the candidate chooses his arm of service, or he may enter a pharmaceutical establishment, the medical or veterinary service. Those who join the artillery are united in one squad, and instructed theoretically and practically by a senior officer. After three or four months' service they are assigned to the batteries, where they are further instructed; the most proficient are employed as instructors, and after six months' service are appointed lance corporals (Gefreite). They are now taught the duties of officers, and are made familiar with all practical artillery subjects.

At the end of their year's service, the one-year volunteers who have been appointed lance corporals are examined practically and theoretically on the general duties of officers, particularly the duties devolving on subaltern officers. At the expiration of the year's service they pass into the reserve, and from there large numbers of the landwehr officers are taken after passing the requisite examination.

Schools for the Instruction of Non-commissioned Officers.

In addition to the foregoing means of instruction, there are certain schools for the purpose of general and technical education; viz., the

(*a*) Battery division school.

(*b*) Regimental or brigade school.

(*c*) The farrier's school.

(*d*) The school of equitation.

(*e*) The general gymnastic school. Besides these, there are schools of the children of soldiers, who, if stationed in places where there are no garrison schools, attend the civil schools at public expense.

(*a*) *The Battery Division School.*

Each battery division has a school where private soldiers are prepared for promotion to the grade of lance corporals (Gefreite) and upper lance corporals (Obergefreite). Usually these schools are under one of the senior captains of the division, and the instructors are intelligent non-commissioned officers. Each battery of the division sends

four soldiers as pupils, who, to be eligible, must have, first, attended an elementary school, and be able to read and write well; second, served at least one year with his battery. The course of study commences October 1 and ends April 30, and embraces reading, writing, spelling, arithmetic, artillery duties. At these schools re-enlisted men prepare to enter the brigade school.

(*b*) *The Brigade School.*

In each artillery brigade there is a brigade school or two regimental schools. The brigade schools are a step in advance of the division schools, and they are maintained for the purpose of preparing worthy non-commissioned officers for the artificer sergeants' (Oberfeuerwerkers') school. Each battery sends from three to four pupils to the school, who, to be eligible, must have been, first, at least nine months in service, and present at the annual exercises; second, possess the necessary education.

In selecting the pupils preference is given those non-commissioned officers who are willing to re-enlist. The director of the school is a field-officer or captain, and the instructors are lieutenants and intelligent non-commissioned officers. The anatomy of the horse is taught by a veterinary surgeon. The school opens October 1, and continues till April 30. The pupils of the school are quartered in barrack-rooms specially set apart for them, and, except for rations and clothing, which they draw with their batteries, they are under the direction of the school from which they receive their pay. They are excused from all duty with their batteries, save for an hour on Thursday and Saturday. The oldest pupil of the class acts as class-leader; he marches the pupils to the school-room, and when the teacher appears (all rise) he reports the number of those present and the names of absentees, stating cause of absence. For the preservation of good order, and for police purposes, each non-commissioned officer except the class-leader is detailed in turn as "under-officer of the day."

The following is the course of theoretical exercises:

Artillery material	4 hours per week.
Mathematics	4 " "
History	2 " "
German grammar	4 " "
Keeping accounts	4 " "
Writing	3 " "
Service duties	2 " "
Geography	2 " "
Drawing	2 " "
Anatomy of horse, care and treatment	1 hour "
Practical exercises	4 hours "

The exercises commence in the morning at eight and continue until noon, from two to four P.M., and from six to eight in the evening, the latter being study hours. The course of instruction is arranged so that soldiers from the lower schools (or those equally well educated) may prepare for the artificer sergeants' school. To make this preparation speedy and certain, the text-books of the brigade schools go no farther than is necessary. Progress is the rule. The artificer sergeants' school commences where the brigade school ends, and in this way no time is lost by useless repetition. The subject of duties, in which instruction is given twice each year, covers all the service requirements of sergeants and corporals in peace and war, and embraces a careful analysis of the battery, division, regiment, and brigade organization of the artillery, together with an outline of the army-corps formation. The practical exercises include drills, fencing, and gymnastics.

(c) *The Farrier's School.*

The farrier schools are two in number, and are located in Gottesam and Breslau. As I did not visit the schools, I have no data.

(d) *The Riding School.*

The object of the riding school is to train officers and non-commissioned officers of cavalry and artillery as riding-masters.

The school is located at Hanover, and consists of a permanent cadre and variable command, divided into two sections,—one for officers, and one for non-commissioned officers.

The cadre of the officers' section: 1 lieutenant-general, director; 1 lieutenant, adjutant; 12 captains and lieutenants, as instructors; 138 enlisted men, 285 horses. Total, 14 officers, 138 men, 285 horses.

The non-commissioned officers' section has 1 officer, 4 enlisted men, 218 horses. Total, 1 officer, 4 enlisted men, 218 horses.

Each cavalry regiment and field artillery brigade sends two officers annually, and each regiment of cavalry two, each regiment of artillery one lance corporal. The course for the officers continues eleven months, that for the non-commissioned officers one year.

This school was not visited.

The Appointment and Promotion of Officers.

As all young men on entering the army as officers are subjected to the same tests, it will be necessary to refer briefly to the general system of appointments before describing the special requirements of artillery officers.

To become an officer of the Prussian army the following qualifications are indispensable:

1. An honorable character and mode of life.
2. A sound body.
3. A good general education.
4. A certain degree of military proficiency.

Two distinct examinations, conducted by a commission appointed by the government, determine beyond doubt the educational fitness of each aspirant. The question of character is decided by a vote of the officers of the corps. The first examination is based on the curriculum of the superior public schools, which is designed to prepare every pupil for the study of a liberal profession. The public schools are classified as follows:

1. The gymnasium, where the students are fully prepared for a university (professional) course.

2. Practical schools, in which certain classical studies of the gymnasium give place to those better adapted to a commercial life.

These schools are of two classes, differing merely in the degree of instruction given, those of the first or higher class approaching, by the importance of their studies, the course in the gymnasium.

3. The burger schools, also of two degrees, in which the instruction is analogous to that given in the practical schools, though not so fully developed.

4. Finally, the professional (polytechnic) schools, where the pupils are fitted for the duties of civil engineers, etc.

All the schools are under the control of the state, and are classified first, second, third, etc., according to their importance. Every aspirant for appointment to the army who can produce a certificate that he has followed the course of a gymnasium or of a practical school of the first class is exempted from the first examination, but not from the second, which, as it covers the special knowledge necessary to an officer, must be sustained by every candidate. In time of war, if an aspirant proves his courage by conspicuous and repeated gallantry before the enemy, and also shows peculiar fitness to command soldiers, he is not required to pass the second or military examination.

The examinations are conducted by the Superior Military Examining Committee, Berlin, which is composed of eleven members, and is divided into two sections. The first section, consisting of four officers of the War Ministry, conducts the second or military examination; the other, composed of seven university professors, the first or general examination.

The recruiting ordinances of the German army prescribe that all non-commissioned officers and soldiers between seventeen and twenty-three years of age who have served not less than six months, and who have passed the general examination, can be appointed ensign (Porte-Epée

Fähnrich) as soon as a vacancy occurs in the regiment to which they belong. The grade of ensign is the first step towards the rank of officer. After passing the first or general examination and serving not less than six months, a candidate becomes ensign (Porte-Epée Fähnrich), and after the second or special examination he is appointed an officer.

A large number of the German officers, say one-third, receive their general education at the cadet schools, from which, however, with but very few exceptions, they pass to the army as ensigns. As the course of study at the cadet schools corresponds to that in the superior public schools, it may be said, therefore, that all officers of the Prussian army have the same origin, in an educational point of view, for it will be observed that they all qualify for the rank of ensign, either at the superior public schools or the cadet schools, and that they all undergo the same examinations.

Ensigns Appointed from Civil Life.

A young man in civil life wishing to be an officer applies to the colonel of a regiment. If received by the colonel, he enters the regiment as an "avantageur," a title given all young men who go into the army with the declared intention of becoming officers. The general examination of ensign can be passed before entering the regiment, or after six months' service.

In a majority of cases the examination is passed before any application is made to enter a regiment. If a candidate presents a certificate showing that he has completed his studies in a gymnasium or practical school of the first class, the examination is dispensed with, but, whether examined or not, the six months' service is required.

The "avantageurs" entering a regiment have the rank of a private soldier, and perform the same duties. For six weeks usually they live in the barracks and eat with the men, although in many regiments they are admitted to the officers' mess. After six months' service, unless they have already done so, the "avantageur" appears before the examining committee, Berlin, with the following credentials:

1. A paper showing age, place of birth, the corps in which he serves, and which he will rejoin after examination.

2. A paper showing the social station of his parents, his religion, a complete history of his studies, and in what institution and under what professors he has worked, and how far his education has been carried, what German, French, and Latin authors he has read; and, finally, all the circumstances which have influenced his education.

3. A certificate showing beyond all doubt that he has been in service at least five months, not including absence for sickness or other cause.

The candidate is examined on the following subjects:

Mathematics, comprising arithmetic, algebra, geometry and trigonometry, geography, and history.

Geometrical drawing and the conventional signs used in topography.

Latin, French, and German.

The subjects are obligatory on all, and the candidate can be further examined on subjects which he may have studied foreign to the programme; as, for example, the natural sciences and any of the modern languages.

The examination continues one week, and is partly written and partly oral. Four days are devoted to the written and three to the oral examination. In the written examination two questions are given on each subject, and the candidate is at liberty to choose which he will answer. From three-quarters to one hour is allowed each question. For example:

Geography.—Question: Give the course of the river Oder; or describe the barometer and thermometer.

History.—Question: The age of Pericles, or, The struggle of the Plebeians and Patricians.

In the topographical examination a written description of ground is given, which the pupil must describe graphically.

As the object of examination is to determine the intelligence of each candidate, great importance is attached to the style and clearness of the answers. The value of the examination is determined by marks from one to nine, and, besides, certain subjects are affected by co-efficients: German, Latin, and mathematics by five; French and history by three, etc. In determining the status of each candidate, the entire commission assembles under the president. They decide who have passed, and who may be re-examined after three, six, or twelve months, when only those subjects are taken up not satisfactory at the first examination. From one-half to two-thirds of the candidates usually pass the first examination, and the number of those rejected at the second examination does not exceed ten per cent. of the whole number of candidates. As for the young men who have passed, they are declared eligible for appointment as ensigns. They return to their regiments to complete the six months of service required, but they can only be appointed to this grade when vacancies occur in their regiments. One ensign is allowed to each company, battery, and squadron, and ordinarily several months elapse before this grade is reached.

Ensigns Appointed from Cadet Schools.

There are six ordinary cadet schools in Prussia, located at Potsdam, Culm, Wahlstadt, Remsberg, Perm, and Iranienstein. They receive pupils between ten and fifteen years of age, while the superior cadet school, Berlin, takes them between fifteen and eighteen years. The

cadet schools are maintained for the sons of officers and worthy citizens, usually public officers.

The instruction is not exclusively military, except in the two highest classes of the superior cadet school, Berlin, but their organization and discipline are military. They were established in 1717, and have always been an object of solicitude and interest to the King of Prussia. The pupils wear a uniform, are formed into companies and battalions, and constitute together the "cadet-corps," under the command of a general officer, although everything pertaining to the admission of candidates is regulated by the inspector-general of education.

The cadets are appointed by the king, and those admitted to the superior school, Berlin, are examined, unless received from the other cadet schools. There are between fifteen hundred and sixteen hundred cadets, and all who are able to do so pay a certain part of the whole expense of their education.

The pupils are admitted each year in the month of May, after a medical examination, when they are classified according to their knowledge and age. The six lower cadet schools are each divided into four classes,—viz., the sixth, fifth, fourth, and third.

The superior school, Berlin, has also four,—viz., the first and second, the first superior and the selecta. Each class is divided into sections, and so arranged that the professors do not usually instruct more than twenty-five pupils at one time. In the six lower classes the course of instruction is the same as that in the gymnasium, except the study of Greek. The studies of the first class superior and the selecta, Berlin, however, are purely military.

The subjects taught in the ordinary cadet schools are sacred history, grammar, French, arithmetic, algebra and geometry, history, ancient and modern, elements of philosophy, drawing and composition, gymnastics, fencing, and dancing.

The same system of discipline prevails in all the cadet schools, except that in the lower schools it is more benevolent than rigorous, and the teachers are advised to use more of admonition than punishment. The commandant of the school and the captains of companies alone have the right to punish.

The course of the superior cadet school, Berlin, continues two years, —one year in the second class, and one in the first class. Some of the better pupils pass a third year at the school in the two highest classes. This school is under the direct supervision of the general commanding the corps of cadets. The course of instruction in the lower class is as follows: Religious instruction, Latin, German, French, mathematics, topographical drawing, sketching, writing for those who write badly.

Cadets who have completed the two years' course are eligible to the grade of ensign. They present themselves before the commission,

Berlin, and submit to the same examination as avantageurs from civil life. If they pass they enter a regiment, but do not obtain the actual grade of ensign until after they have served six months. The young men, therefore, leaving the cadet schools find themselves on the same footing with avantageurs; they have an examination to pass and six months to serve. The cadets who do not pass these examinations, or who are not judged sufficiently instructed for the grade of ensign, are either continued at the school another year or incorporated in their regiments as non-commissioned officers or avantageurs. They are finally examined by the committee, Berlin, for the grade of ensign.

All ensigns, whether avantageurs or cadets, must, before being examined for the grade of officers, follow a course of instruction at a "War School." An exception to this rule is made in the case of avantageurs who have attended a university for one year, and of a certain number of cadets of the first class particularly distinguished for their good conduct and acquirements. They pass either into the first class superior with the rank of corporal, or the class of selecta with the rank of sergeant. These two classes of the superior cadet school receive a course of military instruction which is essentially the same as that given at the War School, for which it is substituted. It embraces:

Artillery.
Tactics.
Fortification.
Topography.
Military law and regulations.
Military correspondence and reports.

Cadets who are to enter the artillery or engineers must also take a course of mathematics. At the end of their studies the cadets of the first class superior and selecta are examined by the committee, Berlin, for the rank of officers; but, notwithstanding the studies of the two classes have been identical, there is a difference in the conditions under which they enter the army.

The selecta receive their appointments without a vote of the corps of officers, and of all the appointees to the army they are the only ones in whose favor this exception is made; this number does not exceed fifty each year. Those of the first class superior join their regiments as ensigns, and after six months' service become officers by a vote of the officers of the regiment. Those of the selecta who fail in their examinations enter the army as ensigns, and are allowed another examination at the end of three months. Those of the first class superior who fail enter the army on the same footing with cadets who left the school in the first class,—that is to say, they must be examined and serve six months before being appointed ensign, and must then go to a War School.

The War School.

With the exception of the cadets of the selecta and first class superior of the school Berlin, and avantageurs who have attended a university for one year, all candidates who have passed the examination of ensign must, before being examined for the grade of officer, complete the course of a War School.

The War Schools were established in 1859. Up to that date each infantry division of an army corps had a school; they gave place to the War Schools.

There are seven War Schools, having a capacity of about one hundred pupils each.

To enter a War School the candidate must have served at least six months in the ranks, although a colonel rarely proposes an avantageur of less than one year's service.

The course continues ten months, and is almost identical with that followed by the selecta and first class superior of the cadet school, Berlin. The pupils receive the same instruction, but are grouped in four classes according to their ability, and this classification is determined by requiring each pupil to discuss one or two historical subjects. The instruction is given by lectures which continue one hour each, and at the rate of sixteen per week. All the pupils ride daily and are perfected in horseback reconnoissances, fencing, and target practice. They are specially instructed in the tactics of their arm, but not exclusively; they must also take part in the exercises of the other arms. Of the ten months' course, eight are devoted to the theoretical studies, with occasional tactical exercises.

The last two months are exclusively given to the practical application of the principles learned, including, of course, tactics.

The discipline of the school is maintained by the instructors, assisted by the oldest pupils. The commandant alone has the power to punish, and in questions of discipline he is only responsible to the inspector-general of education. Quarrels between the pupils are referred to a tribunal of honor, which decides who is the offender and orders the duel, which is conducted according to the customs of the German universities. Every three months the pupils are examined by a commission composed of their professors. At the end of the course they pass the officers' examination before the first section of the superior military commission, Berlin. This commission examines, at Berlin, young men who are admitted to the officers' examination without having been at the War School, but the commission goes to the War Schools for the examination of the pupils who have followed the course. The subjects of examination are the same in both cases, and the examination is both written and oral. The subjects of the written examination are prepared at Berlin and sent to the schools, and the papers of the

pupils are corrected by the professors; when it is finished the president of the superior examining commission, Berlin, accompanied by two members, proceeds to the different War Schools, where they conduct the oral examination. The questions are proposed by the professors in the presence of the commission. The written examination continues four days, and during the oral examination one hour is allowed for each subject.

When the examinations are finished, the members of the commission and professors unite to determine the result. After the examination the pupils return to their regiments. Those who have passed and who by their conduct are considered worthy to become officers, are the subject of a request from the colonels of their respective regiments, addressed to the president of the examining commission, Berlin, for the certificate of capacity as an officer. Those pupils who have passed the examination, yet owing to their conduct or manner of service are not judged capable of receiving the officers' certificate at once, join their regiments and wait until they are considered worthy by their colonels. As for those who fail, another examination awaits them at the end of three, six, or twelve months. It is rarely the case that they are permitted a second course at the school: they must study diligently at their stations and present themselves for examination to the committee, Berlin, at the end of the time specified; if they fail again, they cannot come up a third time without the special authorization of the Emperor, which is seldom given. Ordinarily those who fail at the second examination leave the active army and pass into the reserve, where they complete their term of service. Such cases are exceptional, and do not exceed more than two or three yearly.

The certificate of capacity covers the mental and physical traits, assiduity, and conduct of the ensign, as well as his standing, his breaches of discipline while at the school, and the punishment he has received.

The ensign who has successfully passed all the examinations is eligible for appointment to the grade of officer. When a vacancy occurs in a regiment, the senior ensign is proposed and his name submitted to the corps of officers. If they do not consider him worthy to be received among them, the ensign next below him is proposed. If the officers decide unanimously for or against him, or if a majority vote to admit and a minority to reject, and the minority is composed of but few officers, they must explain the reasons for their action, and the general commanding the army corps decides on the value of the minority vote.

The ensign admitted is commissioned by the emperor, and is received into the corps of officers of his regiment.

Such, in brief, are the tests required of every aspirant for the position of officer. Those entering the infantry and cavalry are subjected to no others, but not so with officers of artillery and engineers, who

must follow a course of instruction in a special school; they are, therefore, on leaving the War School, simply appointed officers of the army, and join their regiments as supernumeraries, and are not commissioned officers of artillery and engineers until they have passed through the United Artillery and Engineer School.

Not less than seventy-five per cent. of the officers of artillery and engineers are educated at the public schools and enter the army as avantageurs after preparing for a profession, and this class of appointments is preferred to any other, as being generally better educated, more amenable to discipline, and, entering the army entirely from choice, are uniformly more zealous and ambitious than those who are trained in the cadet schools. The ordnance store-keepers (Zeugs officers) and master-artificers (Feuerwerks officers) are taken from the meritorious non-commissioned officers of artillery, who are partly educated in the regimental schools and partly at its Oberfeuerwerker's school, Berlin. Their duties have been described.

They constitute a most worthy and efficient body of officers. Although they are placed under regimental officers, it is not because they lack education, intelligence, or ability, but in conformity with a military principle of universal application in Europe, that officers in charge of material, or whose duty it is to prepare and supply munitions and stores, must be directly subordinate to those whose duties are more personal in their application,—that is, who command troops and train them for the ordeal of battle.

Promotion in the artillery is by regular term. Up to the end of the last war, promotion was by seniority throughout the entire artillery, field and foot. Now the two branches are independent of each other, and promotion goes on in the one without regard to the other, though if there should be a great disparity at any time transfers would be made to equalize it. The captains and lieutenants are advanced by regiments, the field-officers according to seniority, irrespective of regiments, as in our own service. The first lieutenants of artillery are examined before promotion; the senior failing the next comes up, and so on, the successful lieutenant taking the vacancy. After a second trial unsuccessful candidates must effect a transfer to some other branch of the service.

The brigade commanders are promoted to be inspectors-general, the highest grade. Although transfers from the artillery to other branches of service are permitted, for reasons heretofore mentioned, transfers to the artillery are never sanctioned; neither are infantry, cavalry, artillery, or engineers generals promoted out of their own arm, save in very rare cases of extraordinary ability to command and fight troops. The generals of the Prussian army are taken from the general staff, where officers are educated in the duties of all arms and branches of the service. On the other hand, suitable promotion is provided for officers of

the artillery in their own corps, and the artillery troops are always commanded by artillery officers. As in other features of organization, the Germans have hit upon the most efficacious means of supplying their army with an intelligent body of officers. The principles they observe lie on the surface and are apparent at a glance. A good character and general education suitable to a course of professional study are qualifications which, combined with suitable military instruction in the army schools, have obtained for the German officers the highest respect of their countrymen and the admiration of all Europe.

J. P. SANGER,
Captain First Artillery, Brevet Major U.S.A.

THE SUN'S REPULSIVE FORCE.

(THIRD PAPER.)

In the previous articles published in THE UNITED SERVICE I particularly applied repulsive force to our solar system, but at the same time I attempted to show that not only in our system, but throughout the whole universe, there were two great governing forces, viz., Attraction and Repulsion. These two acting on matter have brought about the present condition of the universe.

The writer attempted to show the impossibility of one force to bring about the various motions existing in the systems, and that the supposition of another force of a different nature, differently applied, would not be inconsistent with the Newtonian theory of gravitation,—for the difference of these two forces would satisfy his law,—and that the supposition of such a repulsive force would explain many motions heretofore not satisfactorily explained, such as diurnal motion. Repulsion is a force as general as attraction, or what is commonly called gravity, but it differs from the latter both in nature and in its application. We know that gravity attracts bodies according to their weight, its effect is therefore most apparent with solid bodies; whereas I claim that repulsion, the other great governing force in nature, is given off by all cooling and contracting bodies, and in every direction, like the light of a lamp. It is not so apparent as attraction, but yet is really the other force in nature that we should expect from the general law of the conversion and preservation of force.

Repulsion being given off by undulatory vibrations similar to light, much of its force does not affect the planets and other heavenly bodies, for they only intercept a small part of the vibrations which are given off in every direction; but repulsion also serves to dissolve solid matter into the nebulous state and drive it to the confines of the universe, where it is ready to enter into the formation of new suns and new systems, as supposed by Laplace. In our own solar system the force of repulsion from the sun when it meets the earth's atmosphere develops into light, heat, electricity, chemical and vital action.

If we acknowledge a medium in space as necessary in order to convey light and heat from the various suns to their planets, that medium must necessarily offer some resistance to the motion of the planets in

their orbits. It is illogical to suppose a medium so compact that it is able to convey the vibrations of light at the speed of one hundred and eighty-six thousand miles a second is yet of such a nature as to offer no resistance to the planets in their orbits. The fact that the mechanism of the heavens indicates a unity shows that the various bodies of the universe are bound together by some ethereal atmosphere, which, however attenuated, *must be material* in order to propagate the undulatory vibrations of light. Sir John Herschel thought that the ether of space more resembled a solid than air, "in this sense at least, that its particles cannot be supposed as capable of interchanging places, or of bodily transfer to any measurable distance from their own special and assigned localities in the universe." It would follow from this that any body driven through such an ethereal atmosphere must meet with resistance. If, then, we acknowledge that there is a resisting medium in space, the centre of weight of a planet (the earth, for instance) and its atmosphere would be in advance of its centre of figure, for a portion of the atmosphere of such a planet would be forced by the resisting medium from the forward side of the planet to its after side as it moved in its orbit. This would give the planet and its atmosphere, regarded as a whole, a shape not unlike a pear, a greater part of the atmosphere following the solid body of the planet.

Now, attraction acts at the centre of weight,—that is, the centre of the solid body of the planet,—whereas repulsion being given off from the sun like light, meets with resistance not only from the solid body of the planet, but also from its atmosphere. It therefore acts at the centre of figure, a point behind the centre of gravity: the two forces not acting in the same line, a motion of rotation must ensue.

This diurnal motion would accelerate orbital motion, for the repulsive force of the sun, acting at the centre of figure, some distance behind the centre of gravity, can be resolved into two components; one would have a tendency to cause rotation on an axis, and the other would tend to accelerate the forward motion of the planet in its orbit. The increase of orbital motion would continue until the resistance of the medium pervading space exactly equaled the acceleration from this cause. Thus, not only our own solar system, but the whole universe, is driven like clock-work, no body moving in any manner except under the influence and by the action of these two great forces. These two forces exist wherever matter exists, and are inherent in matter itself. Where matter is forming into the solid state, the influence of attraction is more readily observed, and when it is being dissolved by attrition, as in comets, into the gaseous or nebulous state, the action of repulsion is apparent.

In the previous articles the writer acknowledged the unsatisfactory nature of the arguments adduced to support the nebular hypothesis, yet it is probably the most reasonable hypothesis by which to account

for the present condition of the system; and I now claim that the motions not explainable under the supposition of one force only in nature become a necessary part and result of the nebular hypothesis, when we acknowledge that there are two great forces, attraction and repulsion, operating upon matter.

Analogy would lead us to expect that these two great forces brought about the present condition of the systems, for everything we see about us is the result of growth, the essential performing agent of evolution, and growth is but the result of attraction and repulsion.

If we suppose the present condition of the systems to be brought about by gravity alone, there is no conceivable way by which it can return to the nebulous state again. It is illogical to suppose that a system to which we ascribe a beginning is to have no end; on the contrary, it is reasonable to suppose that if the present condition of the systems was evolved from nebulous matter by natural laws, they will return by the action of the same laws to the nebulous condition again, and thus complete the cycle. As we see about us daily numerous examples of reproduction according to general laws, it is only fair to accept what Herbert Spencer lays down as an axiom, "that the same laws prevail in the greater as in the lesser processes of nature."

If we suppose the Creator to bring about worlds and systems of worlds innumerable, in accordance with general laws, we have a better idea of the greatness of His mind and the perfection of His workmanship. We would naturally expect a finite mind to create and maintain such a complex system by a constant succession of miraculous acts, but we should expect a great ruler to govern by general laws.

While we are led to believe that worlds and systems of worlds come into existence in accordance with law, to run the natural course of their existence, and then, by the same forces and in accordance with the same laws, return to the original state, yet we need not believe that man's spiritual welfare is also governed by unchangeable laws; on the contrary, as matter and the soul are supposed to be so distinct, we would naturally expect the laws governing matter to be entirely independent of those controlling man's moral and religious nature.

There is no limit to the belief of Divine interposition in matters connected with the soul. It is entirely a matter of faith, but the government of matter by law is susceptible of proof. As long as the human mind is unable to conceive of the origin of matter, of force, and of the laws governing the action of force upon matter, so long will there be a belief in an Infinite Author as the most natural and simplest method of explaining the unknowable. Of that author we have no more reliable information than that contained in the precepts of the Christian religion.

R. M. G. Brown.

A QUESTION OF QUARTERS.

It all happened years ago,—so long ago, in fact, that many of the participants in the muddle are defunct, others out of service, and those who remain in life and in the army are in the sear and yellow leaf; but it all comes back to me as though it were yesterday, and, just as though you of THE UNITED SERVICE were then the recipients of our cares and contributions (which you were not, for you had then no corporate existence in the literary world), do I now lay this reminiscence before you, for, when it happened, we sought in vain for sympathy. Indeed, did not the chief quartermaster of our department recommend "that the parties in the within case be allowed to fight it out among themselves, in the hope that one or more may receive mortal injuries"? And did not the general commanding give countenance to the recommendation of this blood-thirsty non-combatant, by forbidding further appeal in the matter, and "inviting attention to indorsement thirty-seven hereon, which is approved"?

The case is simply this,—not simply either, for it is the most aggravated complication that ever suffering subaltern got into, and if it were not for Mrs. Briggs I would back General Sherman's views about matrimonial prohibition as applied to lieutenants.

Ours is a four-company post—two of infantry and two of cavalry—commanded by Captain Catamount, who, as you all know, is one of the oldest among the civil appointments in the infantry. The officers' quarters consist of five neat cottage buildings, with verandas all around. They are very nice and substantial; the southernmost, which is intended for the commanding officer and his family, is no larger a building than the others, but it is only one set you see,—the others, except the northernmost, are supposed to be two sets each, under one roof, with the front door and hall in common. They are numbered from south to north; the commanding officer's No. 1, then the next building contains Nos. 2 and 3, then 4 and 5, then 6 and 7, and finally, at the end of the row, is the newest and nicest and best built of the lot, No. 8.

Now, when we infantry people arrived at Camp Sandy we found the cavalry officers domiciled as follows: Captain Gruff and wife were living in Nos. 6 and 7, occupying the whole building with family and

servants; and the rest of the cavalry officers present, Captain Mouton, Lieutenants Ray and Stripling, unmarried, had joined forces and taken possession of No. 8, leaving to the infantry the three buildings to the south. There was no surgeon, only a contract doctor, who had no rights anybody was bound to respect, and who occupied a shelf, like his own medicine bottles, somewhere over in the hospital.

Now, one would suppose that we could have got settled without squabbling, and so we could have done, only some people are so hateful they can't get along anywhere (I beg pardon, I find that, unconsciously, I am using Mrs. Briggs's language, and it was my determination to present an entirely unbiased view of the situation), and this is the way we started:

Of course, Captain and Mrs. Catamount moved into No. 1; Captain Stout (bachelor) took No. 5; Lieutenant and Mrs. Buff took No. 4; Lieutenant and Mrs. Berry, No. 2 (Mrs. Buff and Mrs. Berry are not on speaking terms,—that is, to one another: where any one else is concerned volubility is no word for it; but this is irrelevant), and there was left only one unoccupied set of quarters, unless we stirred up the Gruffs, which nobody cared to do; so our senior second lieutenant, Skinner, a bachelor, a real good fellow, and a prime favorite with Catamount, took a room in his captain's house, and left No. 3 to Mrs. Briggs, me, and the baby, under the same roof with the Berrys.

Here it must be explained that Berry, who by no means deserves half the hard luck he has had in the world, is one of the oldest lieutenants in the service, but he is one of those gentlemen opposite whose name in the army register we used to note the mark ‡, and there was a foot-note, "For the anomalous position of this officer, see G. C. M. O., No. 570, odd." So in the regiment, Berry had to choose below Buff, but out of it, Mrs. Berry stoutly maintained G. C. M. O., 570, odd, which reduced him in rank below Buff, had no legal effect whatever, nor did she hesitate to asseverate that the Bureau of Military Justice fully sustained the point in the matter, and up to this time there had been none to gainsay her.

She had provided herself, *en route* to Camp Sandy, with a roster of the department, and when, on the evening of her arrival, the cavalry subs were presented, she had somewhat nonplussed those young gentlemen, as yet strangers to the vagaries of this remarkable woman, by prefacing even the customary meteorological remarks by a blunt "Let's see! Mr. Ray. Well—we rank *you*. And Mr. Stripling. *Of course* we rank *you*. Now, who else is there?"

Within the week, it may be stated, the eccentricities of Mrs. Berry were as mirthfully appreciated at the cavalry mess as they were grimly tolerated in the veteran —th Foot.

Here we were, then, settled as snugly as the blocks in the 13, 14, 15 puzzle. No one could move without first moving some one else,

unless it were into No. 6, under Captain Gruff's vine and fig-tree; but that consummate strategist, having (through Catamount) learned that it wouldn't be long before Mrs. Berry stirred up a volcano somewhere, he fortified his position by an alliance with the contract-doctor aforementioned, who "chose" No. 6, but generously refrained from occupying the same. Two cavalry lieutenants—Captain Gruff's second and Captain Mouton's first—were on detached service; so, in the order of *original* rank, behold us settled,—

Captain Catamount and family (Infantry), No. 1.
Captain Gruff and family (Cavalry), No. 7 (and 6).
Captain Mouton (with two Cavalry subs), No. 8.
Captain Stout (Infantry), No. 5.
First Lieutenant Berry and wife (Infantry), No. 2.
First Lieutenant Ray (Cavalry), room in No. 8.
First Lieutenant Buff and family (Infantry), No. 4.
Second Lieutenant Skinner (Infantry), room in No. 1.
Second Lieutenant Stripling (Cavalry), room in No. 8.
Second Lieutenant Briggs and wife (Infantry), No. 3.
A. A. Surgeon Heartburn (*de jure* if not *de facto*), No. 6.

Such was the situation when Captain Mouton was ordered to a neighboring post on court-martial duty, Lieutenants Ray and Stripling went out on a scout, and Mrs. Berry, who had been casting longing eyes on No. 8, proceeded to make a leisurely inspection of the premises thus temporarily vacated. In ten days Captain Mouton returned with a six months' leave in his pocket, packed up his traps and started for the States. Then, I regret to chronicle, a vehement disagreement between Mrs. Berry and Mrs. Briggs, to the manifest detriment of the latter, who waxed hysterical, while her older antagonist, a veteran in such scenes, maintained a stony impenetrability.

It all grew out of the "hall and door in common." Whenever our baby wanted to sleep, Mrs. Berry was possessed with a desire to open her parlor door and sing,—and all who ever heard that accomplished lady are aware of the fact that it wasn't so much that she *couldn't* sing, as that she firmly believed she *could*, that alienated her neighbors. Mrs. Briggs's recital of the affair would only be regarded in the light of an *ex parte* statement, so I won't repeat it, but the fact that poor Berry took it upon himself to remonstrate with his better half would indicate that he was far from looking upon the matter from her standpoint. And when it is remembered that Mrs. Berry always resented such defections on the part of her lord by an admirably counterfeited attack of catalepsy, and that the resultant seizure on this occasion was of unusual severity and duration (terminated indeed only by the appearance of Captain Gruff with a bucket of water, which he proposed to

empty over the prostrate head of the victim, upon which she faintly proclaimed him a beast, and, rising from the parlor floor, betook herself to the sanctity of her chamber), the conclusion is irresistible that he must have been powerfully worked upon before he could be brought to rebellion.

The next day Mrs. Berry publicly declared she could no longer live under the same roof with the Briggs', and demanded of Captain Catamount authority to move into No. 8,—now held only by Lieutenants Ray and Stripling. To Captain Catamount's request that she should wait until these young gentlemen returned from their scout, in order to look after their property, Mrs. Berry replied that she had examined every article in the premises, and they hadn't a thing that could not be stored away in the quartermaster's warehouse. That she *had* minutely examined the property left by those cavalrymen proved subsequently to be only too true; but Captain Catamount was compelled to admit that Mrs. Berry had choice of quarters over Lieutenant Ray,—so to her huge satisfaction and Captain Gruff's profane disgust, the personal property of the absent officers was moved out and the Berrys moved in.

Just one week after, at the dead hour of midnight, Lieutenants Ray and Stripling returned tired and dusty from their raid through the mountains. Surprised to find their door locked, they proceeded to rattle on what *had* been Captain Mouton's window, with accompanying shouts of "Oh, Mouton! Hi, Capt'n! Wake up and let us in!" The window slowly opened and the disturbers of the peace recoiled, aghast, before the night-capped head of Mrs. Berry, who smilingly remarked,—

"You see *we* live here now. You'll find all your things over at the store-house."

It is recorded that when those two subalterns reached the fence, the junior looked down from his six feet two inches upon the five feet six inches of his senior, and queried, "Don't this beat hell?" and that on the following morning Mrs. Berry officially reported to Captain Catamount, commanding, that Mr. Stripling had said, in her presence, that she, "a brother officer's wife, was worse than the bad place."

Be that as it may, Messrs. Ray and Stripling, having nowhere to lay their heads, repaired to the post-trader's store, routed out the sleepy Ganymede who presided over the officer's room, and sought surcease of sorrow in bottled beer. Being presently joined by the officer of the day, whose attentive ears were attracted by the sound of profanity by night, and having inaugurated a game of pin-pool for the beer, they worried through the hours till dawn as best they might, and thereby gave color to the story put in circulation by Mrs. B., that they went off and drank and gambled all night long.

I was present in the office, after guard-mounting, when Mr. Ray marched in to make report of his scout against the hostiles. In very

few words he recounted the gratifying fact that his command had recaptured all the stolen horses and stock, and had in two sharp affairs administered sound thrashings to the Indians; but a stiff and unbending acknowledgment of Captain Catamount's hearty congratulations indicated that Ray had a grievance, and, having made his report, out it popped:

"Finally, sir, on our return we find ourselves virtually kicked out into the cold, and my apology for appearing in your office in scouting rig must be the fact that I don't know where my uniforms are."

Bang! came Catamount's fist down upon his bell, and the orderly sprang into the room as though pitched neck and crop from the porch.

"My compliments to Mr. Berry, and say I want to see him at once! Pray sit down, Mr. Ray; I am heartily sorry that this *contretemps* has occurred. I might have known how 'twould be! Blank blank it all to ——!"

Well, here it must be confessed that our senior captain more than swore a blue streak for a moment or two; and Skinner, at the adjutant's desk, was rapidly becoming apoplectic from suppressed laughter.

Mr. Ray seated himself in solemn silence, while Captain Catamount resorted to his *vade-mecum*, the well-thumbed copy of Revised Regulations of '63, without which under his pillow, it used to be said, that conscientious officer never slept.

"Here is the paragraph that covers the case," said he. "I confess it never occurred to me in such a light before; but Mr. Berry—that is—ahem!—Mrs. Berry assured me that they had just such a case at Fort Goliah, and General McDowell decided in her—that is—in his favor. Let me read: 'Paragraph 1077. An officer may select quarters occupied by a junior; but having made his choice must abide by it, and shall not again, at the post, disturb a junior unless himself displaced by a senior.' Now, Mr. Ray, the point is this: When we came here we displaced nobody; we took three vacant houses, but it was and is our prerogative to displace somebody just once, and the Berrys claimed their right while you were gone. Ah! good-morning, Mr. Stripling. Happy to see you back, sir. Never mind your scouting dress. I've just been trying to explain this unpleasant matter to Mr. Ray. Pray sit down, sir."

Mr. Stripling lowered himself into a chair with an expression of sepulchral gravity and merely a bow, and all eyes were turned toward the approaching figure of Mr. Berry, who, it may be said, could make the best kind of time getting away from home, if he did dawdle more or less when it came to returning thither. It was evident to every man present that poor Berry was wofully nervous and ill at ease before he arrived within hailing distance. Catamount lost no time in preliminary ceremonies, but pounced at once upon his victim.

"Mr. Berry, did I not give you explicit instructions that Captain

Mouton's room, in the south wing, was to be reserved until the return of the cavalry officers, and that their property should be moved in there?"

"Why—yes—major," was the nervous and hesitating reply; "but then Puss—a—Mrs. Berry, said she'd see you about it, and—well—that's all I know. She said it was all right."

"Dash it, Mr. Berry! *Who* sent these gentlemen's baggage over to the quartermaster's store-house? and who authorized you to occupy the room I ordered reserved? That's what I want to know."

"Well, a—major, Puss said—that is—Mrs. Berry, I suppose. She told me it was all fixed."

Catamount fairly blazed with wrath; but, to his credit be it said, contented himself with glaring at his subordinate and holding his sides to prevent explosion. The scene in the little office was impressive, if not dramatic. Skinner alone seemed to derive entertainment from his surroundings; his purpled face was buried deep in his arms at the adjutant's desk, but the swelling veins and convulsed upheaving of his shoulders indicated that it was all he could do to suppress a roar of laughter. Gruff had joined the party, sniffing the battle from afar, and with hands thrust deep in his trousers pockets, and chin and paunch alike protruding, was gazing from one person to another with his habitual expression of cynical amusement. Finally Catamount spoke:

"Well, Mr. Berry, that will do for the present. I don't know what to say to you. You may retire, sir." And as poor Berry meekly and drearily slouched homeward to make his report to "Puss," the commanding officer again addressed the glum-looking cavalrymen: "Gentlemen, you have probably discovered before this who ranks in that household, but you don't begin to know the extent of that poor fellow's serfdom. I must shoulder the entire responsibility here. You will sympathize with Mr. Berry when you know him better,—for I must admit that that woman has pulled the wool over my eyes before this. She kept at me for two days for authority to ship your things over to the store-house, and I haven't a doubt she could convince a jury that I gave it, though I swear I didn't."

Here Captain Gruff gave a sniff and retired to the porch. Mr. Ray looked somewhat mollified, and then Mr. Stripling slowly and deliberately addressed the chair:

"Excuse me, major; but since we are now displaced by—ahem!—*Mr.* Berry, am I to understand that we can choose quarters according to rank and rescue our property from the store-house?"

"Certainly, Mr. Stripling, certainly; but meantime I beg you both to become my guests. I trust you will both make my house your home until you are entirely settled." The gentlemen expressed their acknowledgments, but begged a little time to "look around"; and later in the

day a council of war took place in the billiard-room, attended by Captains Gruff and Stout, Lieutenants Ray, Buff, Stripling, and Skinner, the result of which was that at sunset a meeting of most amicable outwardly appearance took place between all parties on the Gruffs' veranda. The cavalry subs were especially courteous to Mrs. Berry, who was present in high spirits. Stripling told most amusing anecdotes, which convulsed everybody with laughter. Mrs. Berry volunteered to sing, and had progressed as far as

"No—non é ver,"

when the assembled greyhounds and deep-mouthed fox-hunters set up a combined yowl that drowned her shrill soprano, and Mrs. Gruff privately charged her husband with starting the canines with his foot, which he did not wholly deny. However, the evening was a success. Mrs. Berry finally fluttered off to her roost after many coquettish good-nights. The party broke up in all apparent amity, but it was the calm before the storm.

Immediately after guard-mounting on the following morning the total commissioned officers of the post assembled at the adjutant's office. Major Catamount looked a trifle surprised at the unusual array, but said nothing. Routine business having been disposed of, Lieutenant Ray very respectfully inquired if the matter of selection of quarters was now in order, and being answered in the affirmative, proceeded with:

"It is most distasteful to me to displace any family, major, but there seems to be no alternative. As Mr. Berry has taken my quarters, I shall have to take Mr. Buff's."

Here all eyes were fixed upon the jovial features of Mr. Buff, who calmly responded:

"In that case, major, I shall be reluctantly compelled to oust Mr. Berry."

"What!" exclaimed Catamount. "Stop a moment. Why, how the devil——"

"It's all right, major," broke in Buff. "That's just according to Mrs. Berry's register. Berry ranks Ray, Ray ranks me, and I rank Berry."

"Then, Mr. Berry," said the commander, "where the mischief will you go?"

Poor Berry sat a moment like one in a daze, slowly twirling his shabby old forage-cap in his fingers. At last he dreamily rose.

"I'll go and see what Puss says." Ten minutes later a servant appeared at the office door: "Beg pardon, sir, but Mrs. Berry's took with fits and wants to see the doctor." And it was evident that the Berry boomerang had come back with a crash.

That evening Messrs. Ray and Stripling, returning from stables, raised their caps in courteous salutation to Mrs. Berry as that restored

Amazon was taking the air upon the veranda of No. 8, but for sole acknowledgment received a withering glare of contempt.

Half an hour afterwards, while the three captains were, with much subdued laughter, discussing the situation on the Gruffs' door-step, they were suddenly pounced upon by Mrs. Berry and a paper.

"Major Catamount, *I* won't be imposed upon, whatever my husband may put up with!" ("The Lord only knows how much that is," muttered Stout, at which Catamount and Gruff wellnigh exploded; but Mrs. Berry was too much engrossed with the matter at hand to notice the *sotto voce*). "Here's what the judge-advocate-general says about Mr. Berry's rank, and I hold to that." ("Then you've lost your holt," muttered Stout again: "they've retired him.") "If my husband ranks Mr. Ray, he ranks everybody Mr. Ray ranks; now don't he?"

"Very possibly, madam, but the rule works both ways, and as Mr. Ray ranks Mr. Buff, he ranks everybody Mr. Buff ranks. Mr. Evarts has exhausted the subject of consequential damages, and it can't be renewed here. Mr. Ray don't claim to rank Mr. Berry at all; he only chooses to take Mr. Buff's quarters because you have turned him out in the cold. And if Mr. Buff now claims the right to displace you, why, it's only your husband's fault that he happens to be below Mr. Buff, and only yours that the question occurred at all. If you hadn't insisted on moving into No. 8 nothing of the kind would have happened."

For a moment even Mrs. Berry was aghast at the unwonted display of spirit on the major's part. Never before in all the lingual conflicts of her past had she been known to hesitate; but then for the first time in the records of the gallant —th had this one of its officers dared to oppose her in wordy battle. Catamount had spoken firmly and even sternly, but without a vestige of temper. Then came the feminine *riposte*,—a stony glare, and then the hissing response:

"Well, the time was when such a thing as *esprit de corps* was known in this regiment, but consolidation ruined *that*. *My* husband never served in any other, and was an honored officer of this when you were—yes, and you too, Captain Stout—members of some mere *mushroom* affair. Neither of you belong to us; but they had to put you somewhere, I suppose, and we who have spent our lives in the —th have to suffer for it. No wonder we old stagers can get no justice from you. Now we'll see what the department commander will say." And the indignant lady swept from their presence.

"Faith," said Stout, "she's mad this time, or she'd never call herself an old stager. I'm used to being a mushroom."

Next morning there arrived at the adjutant's office a weighty communication. It was principally remarkable at the time because of the utter variance between its tremulous penmanship and its vigorous and trenchant style. Vehemently drafted by Mrs. Berry, submissively

copied by her husband (is it irrelevant here to state that among the "old stagers" of the —th Foot they are known as "Elderberry" and "Gooseberry" respectively?), that document has been the recipient of more "remark," pithy and prolix, truculent and explanatory, than any paper that has gone the rounds in our unusually arid department within the memory of the oldest indorsement-book in the A. G. O., and its original bulk has been absolutely quadrupled by the number of additional sheets pasted on in successive layers for the reception of the views of at least one-tenth of the "total commissioned" on the division muster-rolls. And now, six months afterwards, I declare that all this expenditure of time, patience, brains, and red ink has been absolutely of no effect. The paper is only valuable as a collection of autographs, and we, the unoffending Briggs', are occupying the attic rooms in No. 4, over the "orchestra," as the Berrys' parlor is garrisonially termed.

The story is long and dismal, and I shall simply mention facts from this on. Mrs. Briggs, Baby Briggs and I have made eleven moves in five months, and now, just as we were beginning to hope for one that would benefit us (the last one "gave us a lift," to be sure, as Captain Stout suggested, but it was a lift to a loft, and the worst move yet), out comes this injunction from the department commander, and we are told to stay where we are.

To go back to the original move. Of course the Berrys had to leave No. 8, and everybody expected they would go back to No. 2, where they belonged, pending decision on the appeal which had been duly forwarded. Mrs. Briggs and I were not happy at the idea of their coming back to our habitation, but to the amazement of all concerned Mr. Berry said that Puss had decided on No. 6; and so she had, for she had never forgiven the Gruffs for certain witticisms which were traced (to her satisfaction) to the satirical captain. Besides, had he not offered to spill a bucket of water over her when she fainted?

Now, up to this time Gruff was hugely enjoying the "*bouleversement.*" It was no end of fun to him, but when it came to stubbing his own toes the matter assumed a different light, and Gruff saw fit to growl at Catamount for promptly assigning Lieutenant Berry to No. 6, and directing that Dr. Heartburn (who had never been in there) should move elsewhere.

Gruff swore he wouldn't live under the same roof with Mrs. Berry, and was almost insubordinate to Catamount. This "Cat" wouldn't tolerate an instant, and sternly rebuked him, and then and there a breach commenced to widen between the two veterans; and as we had now got shaken down into place again (Mr. Stripling having moved into No. 2, next to us), what does Gruff do but commence stirring up the doctor to make a fuss because *he* hadn't quarters. That matter was settled quick enough. The Berry communication had been shuttlecocking to and fro between us and department headquar-

ters for a fortnight or so, and *somebody* at department headquarters was getting angry, and the next thing we knew Captain Donnerwetter, assistant surgeon, arrived at Camp Sandy, reported for duty, and all were agog to see whose quarters he would take. Well, Dr. Donnerwetter took No. 8, and the Buffs, passing over the Berrys this time, notified us to turn out. In vain Messrs. Ray and Stripling offered their quarters. Nos. 2 and 4 had southern exposures, and were too warm for a big family in that climate, so we had to go,—but where? Every set at the post was now occupied by my seniors. Mr. Ray of the cavalry promptly informed Mrs. Briggs that his quarters were now hers. "I'll go in and roost with Stripling, but by keeping No. 4 in my name no one whom I rank can disturb you." And my poor, perplexed little wife thanked him with tears in her eyes, and Mr. Ray moved his traps into No. 2.

All this time there was the mischief to pay between the Gruffs and Mrs. Berry, cataleptics were of daily occurrence, when suddenly there came flashing over the telegraph the news of deaths and retirements in the cavalry, and from third or fourth on the list Captain Gruff became Major Gruff; "Comparatively speaking, Major Gruffer," said Captain Stout.

"There's many a split
'Twixt the butt and wit."

Gruff heard of it that same evening (through Mrs. Berry) and vowed vengeance. Catamount and the other officers congratulated the new major with excellent grace, but when in two weeks the new commission came, what was the consternation of the garrison to receive with it the order assigning Major Gruff to the command of Camp Sandy, and the next morning the Catamounts commenced vacating No. 1, and ousted Dr. Donnerwetter from No. 8. Donnerwetter declared he wouldn't live under the Berry roof, and ousted Captain Stout. Stout simply moved next door and "displaced" us, and, once again, where had we to go? There was no longer room for Skinner with the Catamounts, so he had taken the despised shelter of No. 7. Our good friends Messrs. Ray and Stripling moved us bodily into their premises for the night, and there we discussed the situation. Just before tattoo Skinner came in like an explosion. "Here's fun, fellows. Mrs. Berry says that she'd like to see any lieutenant in the army turn her out *now*, excepting those Third Infantry patriarchs. She's got some kind of a letter from headquarters, and is just laying down the law to the crowd. Come out and hear her." So we masculines took our pipes and strolled up the line in the cool evening air and came upon a group at No. 6, where, sure enough, Mrs. Berry was holding forth to Gruff, Catamount, the doctors, and Stout, who were nudging one another in the ribs and encouraging her to proceed, especially Stout, by exasperating expressions of incredulity.

Poor Berry was occasionally putting in a warning word of, "Now,

Puss, don't talk so foolish;" but for all reply received, "You be quiet; *I* know what orders and regulations mean."

Half an hour afterwards Mr. Buff joined the party, and said, "Well, Berry, I'm sorry that there seems no end of this moving, but Ray takes my house to-morrow, so I must have yours."

"If you do," almost screamed Mrs. Berry, "I'll turn out Mr. Ray, the little snob, myself, and then what will become of the Briggses?"

Her gigantic intellect had grasped the intricacies of the plot, but couldn't stop the move. Buff ousted them from No. 6; then she recoiled upon Ray in No. 3, which, he informed her, was much at her service, as he never intended to live there; and then, to Mrs. Berry's infuriation, Mr. Skinner abandoned No. 7 at Mr. Ray's demand (the two scamps had planned it all the night before), and we, the Briggs', were once again comfortably and happily housed, thanks to our bachelor friends Ray, Skinner, and Stripling, who now kept a "ranch," as they termed it, in No. 2, actually sleeping at night under the same roof that sheltered the "Old Stager."

For seven blessed weeks did we live in undisturbed happiness and comfort in No. 7. The house was full of all manner of handy little nooks, shelves, and closets, and the Gruffs had not only made all these improvements, but kept everything fresh and neat as a new pin. Mrs. Briggs fairly danced with delight, and Baby Briggs throve apace. A new captain, of course, was promoted, *vice* Gruff, but he was on staff duty in the distant East. No fear of him, and we laughed to scorn all the ominous tales we heard of Mrs. Berry's threats and prophecies. "Oh, yes!" that lady was reported to have remarked to every shoulder-strap in the garrison, "you think I'm outwitted, but you'll see, you'll see;" but the skies were too clear, and we minded not the rumbling of her thunder. Gruff made a tip-top post-commander. Just let him run things his own way, and there wasn't a better fellow alive to serve under. Even Catamount admitted that, and was a loyal and cheerful subordinate to his late cantankerous inferior.

One beautiful June evening as the mail was distributed Mrs. Berry's excited reception of her budget was a source of some remark. Ten minutes later, as the group of bachelor officers was making its way to the mess-room, it was halted by her triumphant hail, and in a tone of voice audible to half the garrison our sibyl declaimed, "You wouldn't believe me: *now* what do you think?" and then reading, "'Mr. Ray, with his company, change posts at once with Captain Hickox.' Aha, Mr. Ray! Everybody says Camp Villikens is the nearest thing to purgatory, and there's where *you're* ordered."

"Faith, madam," interposed Captain Stout, "Mr. Ray knows it will be incomplete without you, but he's too bashful to say so."

"*In*deed, sir! Well,—Mr. Ray seems going to the bad place by intermediate stations, but you'll go direct," retorts "Puss," whose wits

and claws are sharpened by daily exercise at this graceful *badinage*, and now rushes off to tell Mrs. Catamount and the rest of the "Row" the important tidings.

They turned out to be only too true. We sadly parted with Mr. Ray and his company two days after, and on my return in the evening from a long day's ride, to "see them off," I found Mrs. Briggs utterly prostrated and almost unable to give any account of the cause of her distress. Our Hibernian servant supplied, with native volubility, all that was lacking on that point.

"'Twas all along o' that she divil in No. 3, sir. She do be comin' in here the momint you're gone, and, oh, my! my! she's worse than Kelly when he was dhrunk." As this was the acme of our Molly's idea of riotous behavior, she must have been pretty bad. Gradually I learned that during the morning Mrs. Berry had marched in unannounced, informed Mrs. Briggs that she must commence packing up at once, as she, Mrs. Berry, proposed moving in to-morrow. Major Gruff had promised her the quarters. Mrs. Briggs had declined to pack up a thing until her husband returned. Mrs. Berry had twice again invaded the premises during the afternoon, and added violent abuse to her previous remarks, and finally left her youthful and inexperienced victim utterly prostrate.

Major Gruff, of course, had to be informed of what had taken place. I confess to having almost assaulted poor Berry that evening, before the absolute absurdity of holding him responsible for his wife's vagaries could be fully impressed upon me by Catamount and others, who had hastened to advise and prevent a row.

Gruff positively denied having promised Mrs. Berry our quarters, fairly blazed with indignation at the idea, and then Mrs. Berry as positively denied having said anything of the kind. But matters only slumbered a week. Then came Captain Hickox, generally known as "Hiccoughs," with his array, and what we Camp Sandy people had done to deserve such an infliction at the hands of our department commander is beyond human comprehension. Captain Hickox was accompanied by Mrs. and four juvenile H.'s, by First Lieutenant O'Grady with his wife and three youngsters, and by Second Lieutenant Tompkinson, wife, and baby. Mrs. O'Grady was a younger sister of Mrs. Captain Hickox, and Mrs. Tompkinson was but three years previous the sole remaining unmarried sister of that stalwart warrior himself. Hickox had disposed of three of those sororal incumbrances among the subalterns of the various regiments with which he happened to be stationed; and this was the close corporation that marched in upon us, already wellnigh distracted with our own troubles.

I won't harrow your nerves with details of what followed. Within the next four days anarchy reigned supreme, and Mrs. Berry had alternated hysterics with catalepsy, until both doctors had sworn off

from further attendance on the patient, and at the end of the week we Briggs' had not where to lay our heads. Captain Stout and Dr. Donnerwetter had done us a good turn by clubbing together so that we could occupy Captain Stout's quarters, and Major Gruff had congratulated us on our good fortune, but nothing could save us from the relentless energy of Mrs. Berry. Forced by the fortune of war to live once again under the same roof with Mrs. Buff, who was more than her match when it came to open hostilities, she had been secretly at work, and the very next back-trip of that confounded communication brought as indorsement twenty-third the decision of the department commander that officers could not select quarters and give them to favored inferiors, as, "so it is alleged," is now the case at Camp Sandy.

This forced us out in the cold again. Then came another charitable effort on the part of Dr. Donnerwetter, who gave us all his house but the attic, in which he smoked, slept, and read. Then came Captain Mouton back from leave, *with a bride*, and boosted Stout out of No. 2, and once again we poor shuttlecocks were tossed upon the world, and I begged a six months' leave or the acceptance of my resignation, both of which failed, but an order came to "cut down the allowance of rooms at Camp Sandy" *pro rata*, and this is the way it was done. Major Gruff gave Skinner his old room up-stairs in No. 1; Captain Mouton and bride took their second lieutenant, Stripling, into their attic; Captains Stout and Donnerwetter were consolidated in No. 3; Mr. and Mrs. Berry alone in No. 4; Mr. and Mrs. Buff and four children in No. 5. The entire "Hiccoughs Brigade," the captain, both lieutenants, the three wives and families, were condensed in Nos. 6 and 7, and Captain Catamount, wife, and family occupied No. 8, in which Dr. Heartburn was assigned a sleeping-room. We had our choice between the open parade or the attic over the Berrys, and with sore hearts thither we drifted; and here in the long summer mornings my poor wife sits at her work, and the melodies of Mrs. Berry float upward to her through the stove-pipe hole. Storm-tossed and exhausted, we are almost thankful at being anywhere. We at least have the consolation of knowing that in getting so high we have fallen so low that even the laundresses would not "displace us," so long as Mrs. Berry reigns beneath. Are we wrong in appealing to you in all that the name implies, to THE UNITED SERVICE, for the sympathy that is beyond us here?

PETER BRIGGS,
Second Lieutenant —th Foot.

WAR-SHIPS AND NAVIES OF THE WORLD.

THIS work[1] embodies information as to the extent and character of recent changes in types of war-ships, and of the mechanical appliances designed for use in naval warfare, descriptions of the war-ships of the navies of the world, with details relating to armored and unarmored ships, especially cruisers of the rapid type, including their speed trials. Considerable space is allotted to modern artillery, recently devised armor-plates, torpedoes, torpedo-boats, compound-engines, etc., and, in conclusion, an important comprehensive summary of the needs of the United States navy.

Having served in the first paddle-wheel frigate, and in the first screw war-ship, in all the first steamers of the United States navy, the "Fulton" excepted; as inspector of ocean mail-steamers; as chief engineer of a principal navy-yard, and of the North Atlantic fleet in the early part of the Civil War; subsequently as superintendent of construction of all the armor-clads built west of the Alleghanies; for four years at the head of the engineering department of the navy, and withal, having served in battle in both the Mexican and Civil Wars, Chief Engineer King was peculiarly well fitted by experience and attainments for the important duty of collecting, under the orders of the government of the United States, the information which, first submitted in the form of reports to the Navy Department in 1877 and 1878, is now, with additional matter, completing the record of progress to the date of publication, presented in a form as acceptable to the general reader as to those professionally interested in the subject.

From a brief reference to the *lead-clad* ship of the Knights of St. John in 1530, the floating batteries employed at the siege of Gibraltar, the suggestion of iron-armor in 1812 in this country, the bomb-proof vessel patented by Gregg of Pennsylvania, and the iron-armored ship-of-war, the construction of which was begun in 1842 by R. L. Stevens, of New Jersey, the author passes to the first use of wrought-iron plates as a defense for the sides of vessels, made by the French during the Crimean war, and to the construction in 1853 of their first armor-plated floating batteries, to be used against the Russian forts in the

[1] "THE WAR-SHIPS AND NAVIES OF THE WORLD." By Chief Engineer J. W. King, U.S.N.

Baltic, and which rendered efficient service at the bombardment of Kinburn in 1855,—their success leading to the construction of the "Gloire," laid down in 1858, followed by others of the same type, wooden ships uniformly protected by four and one-half or four inches of iron for a considerable length amidships, their ends exposed.

The English in 1860 launched the "Warrior," an iron ship three hundred and eighty feet long, of nine thousand one hundred and thirty-seven tons displacement, armored at the middle only with four and one-half-inch iron, her ends, including rudder-head and steering-gear, exposed. She carried thirty-six 68-pounder smooth-bores, and attained a speed of more than fourteen knots. Her hull, now twenty years old, presents no sign of deterioration. Next came the "Black Prince," launched in 1861, of the same type, displacement, and armament; and soon after, the "Defense" and "Resistance," followed by the "Hector," all iron hulls, and the wooden ships, "Prince Consort," "Royal Oak," and several others, converted into ironclads and launched in 1862–63–64.

But Chief Engineer King dates the armor-clad epoch from the first battle between ironclads, which occurred March 9, 1862, between the little "Monitor" and the "Merrimac" ("Virginia"), in Hampton Roads. It was, however, rather the demonstration on the preceding day, the 8th, of the inability of wooden ships to contend with ironclads which awakened European powers to the consciousness "that the proud navies which had so long been relied on for national defense were powerless before the new creation."

In the encounter between the "Merrimac" and "Monitor," the "Monitor," armed with two 11-inch smooth-bore guns, was unable to damage the "Merrimac"; while the "Merrimac," with an armament of six 9-inch Dahlgren shell-guns and two 6.4-inch rifles in broadside, with two 7-inch rifles, bow- and stern-guns, unprovided with solid projectiles for the unexpected encounter, could not develop the power of her ordnance. The inference drawn from that action, under the impression that the "Merrimac" had been seriously injured by the fire of the "Monitor," strengthened by the gallant interposition of that vessel between the "Merrimac" and the frigate "Minnesota," at the beginning of the action on the 9th, and subsequently, when the "Merrimac," finding her shell-fire upon the "Monitor" useless, turned her guns upon the wooden frigate, was more favorable to the revolving turret system, as compared with the broadside system, than it would have otherwise been.

It is somewhat remarkable that these vessels represented two principles of construction, the relative advantages of which cannot be said even now to have been completely determined, although eighteen years have elapsed since they were opposed. The "Monitor" has been often described, and the circumstances attending her construction are well known. Of the "Merrimac" less is known. It may not, therefore, be out of place, in tracing the progress of improvement, as developed in the

pages of Chief Engineer King's valuable work, to refer to the following specifications of a patent granted by the Confederate government, July 29, 1862, for an improved form of vessel, to be ironclad and, if desired, armed with cannon. "The nature of this invention consists in so constructing the hull of the vessel that the bow and stern, A and B, shall each extend beyond the forward- and after-ends of the shield C, which protects the guns and crew, sufficiently to give the sharpness necessary to the attainment of high speed, and the buoyancy to support the weight of iron covering the shield and sides of the vessel without increase of draft. Being submerged, all that part of the hull not covered by the shield is protected by the water from the projectiles of an enemy. The shield proposed for such improved form of vessel is of wood, covered on the exterior with iron, the surface inclined at such an angle as will permit the guns to be worked in the usual manner and yet deflect projectiles impinging upon it. This angle will be between 40° and 50°; the ends of the shield may be about two feet under water. To divide and prevent the water over the submerged part of the vessel from banking up at the forward- or after-ends of the shield on going ahead or astern, and thereby retarding her progress, and perhaps preventing the use of the bow- or stern-gun, a false bow and stern, or tanks, are constructed upon the submerged portion of the vessel, corresponding more or less in form with the hull below. The false bow and stern may be decked, in which case they should not be so high above water as to interfere with firing of the bow- and stern-guns. These tanks may be used as reservoirs of water, by which the draft of the vessel may be regulated at will. The stem, being submerged, may be fitted as a ram to strike the wooden bottom of ironclads. This plan of construction is applicable in plating effectively ships built in the usual manner, it being simply necessary to remove the upper works, and to cut them down forward and abaft the shield sufficiently to submerge the ends when down to the load-line, as illustrated in the case of the Confederate States steamer 'Virginia' ('Merrimac'), which vessel was constructed in accordance with the plan herein set forth, furnished by me, on the 23d day of June, 1861, to the Hon. S. R. Mallory, Secretary of the Navy."

This plan was applied to the "Merrimac," in preference to constructing a new vessel of eight or ten feet draft, in consequence of the difficulty of procuring in time boilers and engines suitable to her purpose. The boilers of the "Merrimac" were good, and as the chief engineer—Williamson—was of opinion that the engines could be speedily repaired, it was considered expedient to apply the plan to her.

The "Merrimac" went into action in an incomplete state, her side armor, under water, not having been applied, and without the superstructure referred to in the specification above given. Subsequently, during the war, plans for sea-going armored ships on this principle were sent to England, with instructions to modify them in accordance

with the progress made in that country in the improvement of armor and ordnance. As experiment had shown that the armor of that day, when placed vertically, was not capable of resisting even 7-inch Confederate rifles, it was thought necessary to retain, in the plan of the sea-going ship, the inclined shield. The superstructure, divided into compartments, was therefore carried completely around the shield, with embrasures corresponding to the parts; the height of the ports forward of and abaft the shield so adjusted as not to interfere with bow and stern fire.

But, to resume, the English, seeking increased protection and power, constructed the five-masted sister-ships, "Minotaur," "Northumberland," and "Agincourt," each four hundred feet in length, fifty-nine and a half feet in breadth, and of twenty-six and one-half feet mean draft; protected from stern to stem by five-and-a-half-inch iron backed by ten inches of teak. But this simple extension produced unhandy craft, and, passing to a system of construction in accordance with principles developed in bridge or girder building (the bracket-frame system), the "Bellerophon," three hundred feet in length, fifty-six feet in breadth, designed by Mr. Reed, was built and launched in 1865. Fitted as a ram, with ninety-one feet of battery, and the whole of the water-line, three hundred feet, to the depth of six feet below, protected by six inches of iron, mounting ten 12-ton guns in broadside, two 6½-ton guns in an armored bow battery, and three of the same weight unprotected, she still lacked that essential feature of a fighting ship, end-on fire of heavy guns.

But in the next great broadside-ship, the "Hercules," with projecting ram-bow, launched in 1868, this defect was obviated by recessing the ship's side, forward of and abaft the battery of 18-ton guns, so that the two forward- and two after-guns, mounted on turn-tables in the angles of the battery, could be fired within a few degrees of the line of the keel, or, if required, in broadside. She carried also two 12-ton and four 6½-ton guns. The armor of that day attained its maximum thickness in the "Hercules."

In the "Sultan," launched in 1870, a further step was made in adding an upper-deck battery, her armament consisting of eight 18-ton guns on the lower deck, two 12-ton guns on the upper-deck casemate, two on the upper deck, forward, and twelve 9-ton guns, but not commanding an all-round fire.

Her motive machinery was of the simple trunk type, similar to that of the "Hercules," "Bellerophon," and other ships; her speed, on the measured mile, fourteen knots.

We now come to the "Audacious" class, consisting of six similar broadside-ships of Admiralty design,—viz., the "Audacious," "Iron Duke," "Vanguard," "Invincible," "Triumph," and "Swiftsure," recommended by the Controller of the Navy as superior to any of seven designs submitted by as many eminent ship-building firms invited to contend for a prize. These designs included two broadside-ships, one

compound broadside and turret-ship, one broadside-ship with a movable upper-deck battery, and three turret-ships, all fulfilling certain imposed conditions, including an all-round fire, or, at least, that some one gun behind armor-plates should command every point of the horizon. These disappointed ship-builders had the satisfaction of knowing that, in presenting the results of their labors for comparison, they had doubtless made an important contribution to the constructor's art.

Less than one-half the broadside of the "Audacious" is plated. Amidships, for one hundred feet by three feet, at the water-line, the armor is eight inches in thickness, tapering to four and a half inches at the bow and stern; at other parts it is six inches thick, excepting the ends of the main-deck battery, which are of four and five-inch armor. The ends of the upper-deck battery are unprotected. The "Audacious" possesses the property of steadiness in a remarkable degree. Running before a heavy sea and strong wind, with stern-ports barred in, she did not roll more than 2° to 1° each way. An ironclad flag-ship, of a first-class naval power, accompanying her, rolled 20°.

The "Alexandra," a broadside, armored, masted ship, of nine thousand four hundred and ninety-two tons displacement, completed in 1877, presents a further development of the central battery, by which, of twelve guns on two decks, four, including the heaviest, can fire straight ahead, and two straight astern. On each broadside from four to six guns can be fought according to the bearing of the enemy. On the main deck are eight 18-ton guns, three on each side, for broadside fire only, and two forward for end-on as well as broadside fire. The protecting armor, eight inches thick on main deck, forming an octangular inclosure, is carried up above the six broadside-guns to form a similar inclosure, six inches thick, on the upper deck, in which are mounted two 25-ton guns forward, and two 18-ton guns aft. The forward armor of the upper inclosure is continued down as a bulkhead, separating the two forward guns of the main-deck battery from the six broadside-guns. The recessing principle, by which end-on fire is obtained, is carried to the extent of setting back the whole side of the ship from the level of the main-deck, at the top of the armor belt, which has a maximum thickness of twelve inches and is carried down over the ram. The description of this ship, as given by Chief Engineer King, is very full, and, illustrating, as it does, approved methods of subdivision, symmetrical and complete, is well worthy of careful study. She is also the first cruising, armored, broadside-ship engined on the compound system. Referring to the "Alexandra," Chief Engineer King says, "The broadside system for masted vessels fairly holds its own against the turrets. The hitherto unknown perfection to which it has been brought in the 'Alexandra' appears likely to give it a new lease of life, especially in combination with all-round fire from fixed turrets on the upper-deck, as applied in the 'Téméraire.'"

It is *this* ship that Commodore Simpson selects as presenting a suitable type for discussion, in view of the wants of the navy of the United States.

The "Téméraire," also a sea-going ship, carries on her main deck four 18-ton guns, for broadside fire only, and two 25-ton guns for bow fire, protected by ten-inch armor, arranged as in the "Alexandra." On the upper deck are two 25-ton guns, in the broad parts of fixed, pear-shaped turrets, one forward, the other aft, plated with eight-inch and ten-inch iron respectively. These guns, mounted on turn-tables, are worked on the disappearing principle by Mr. Reudel's system. The gun is raised to be fired over the edge of the turret, and immediately after firing sinks under cover to be loaded. The powder and shell are brought from the magazine to the muzzle of the gun by means of a hydraulic hoist working in an armored shaft three and a half feet in diameter, at the narrow, inboard end of the turret, to which the muzzle of the gun is turned in loading, and where, under cover, are placed the rammers, levers, and gearing. On trial, the time from fire to fire was one and a half minutes. It has been reported, however, that, as applied in this ship, the success of the disappearing system has not been such as to justify its adoption in others. The armor-belt, which has a maximum thickness of eleven inches, is carried down over the point of the ram, which projects eight feet beyond the bow. The magazines are protected from raking fire aft by a bulkhead across the hold, plated with five-inch armor.

The "Shannon," begun in 1874 and completed in 1877, is a broadside, open-deck cruising-ship, two hundred and sixty feet in length, fifty-four feet in breadth, with a single lifting screw; sails to be used under all ordinary conditions. She presents an application of the submerged-end principle in combination with heavy bow-guns and ram. The armor is limited to a belt four feet above and five feet below the water-line, at which it is nine inches thick, diminishing both ways. It extends around the after-part of the vessel, but ends abruptly sixty feet from the bow, at an armored bulkhead of the same thickness which extends across the vessel and to the depth of five feet. Forward of this bulkhead, the armor, diminished to three-inch plate, takes the form of a submerged deck five feet below water, sloping to ten feet at the stem. The armored bulkhead, rising to the height of twenty feet above the water-line, extends aft twenty-six feet on each side, protecting both decks from raking fire ahead, and two 18-ton guns from broadside bow fire. The remainder of the armament consists of six 12-ton guns, three on each broadside, and one 12-ton stern-gun, on a platform aft, intended to be fought at either of two broadside ports. The deck abaft the bulkhead is of iron one and a half inches thick, covered with wood. Within the space included between the wings of the bulkhead are instruments for communication with the engine-room, helm, and battery. When

engaged on the beam, her guns, excepting the two bow-guns, are unprotected by armor, and against an enemy astern the entire battery is as unprotected as it would be in an unarmored ship. It is intended that the "Shannon" shall, when possible, present her bow to the enemy, as the men can be withdrawn under cover of the armor, and the guns laid on the broadside can be discharged by electricity when passing an enemy after an attempt to ram. Coal-tanks were introduced for the first time at the bow of this vessel, and important unarmored parts are protected by iron boxes about two feet in breadth, filled with old rope, canvas, etc. The capacity of the coal-bunkers is only five hundred tons.

In the "Nelson" and "Northampton," double-decked sister-ships, the system of end-protection, as applied in the "Shannon," is not limited to the bow, but is applied to the stern also. A similar side armor-belt on the water-line extends for a distance of one hundred and eighty-one feet amidships, from after to forward armored bulkheads, and thence as three-inch submerged-deck armor, sloping to the extremities. These bulkheads have in all a depth of twenty-two feet, and each protects two 18-ton guns on the main deck, training in corner-ports, with broadside- and bow- and stern-fire respectively, and an intermediate battery of eight 12-ton guns in broadside, without side-armor protection, but separated by splinter-screens one inch thick. As in all cases in which superstructures are applied to submerged ends, proper buoyancy is partly dependent upon the displacement of the bulk of the inclosed spaces forward and aft lying above the armored deck and below the water-line, these spaces have been filled up as far as possible with water, excluding stores, such as coal- and water-tanks and coffer-dams. The ram is a heavy triangular plate set vertically, and terminating in a sharp point eleven feet in advance of the stem. It is supported by two side-plates three inches thick, which may be regarded as a continuation of the armored deck. The "Northampton" carries two sixty-feet torpedo-boats having a speed of sixteen knots.

With four thousand horses, say two-thirds power, the ship goes, in smooth water, twelve and three-quarter knots with average coal. She may therefore steam twelve and a half knots with consumption, for all purposes, of one hundred tons per day. For twelve days, at this speed, the distance would be three thousand five hundred nautical miles. With two thousand three hundred horse-power, she attained a speed of 10.53 knots, so that with sixty tons per day she would make ten and a half knots, and should steam five thousand miles.

In adopting the turret, fixed or revolving, for coast-defense vessels, an important improvement in the sea-going qualities of the "Monitor" type—low free-board and flush deck—was made by the addition of what is termed the "breastwork," as illustrated in the "Glatton," "Hotspur," and "Rupert," the three most powerful of the coast defenders.

In the "Glatton," an iron, double-bottomed, twin-screw turret-ship, divided into compartments and protected by ten- and twelve-inch armor, backed by eighteen and twenty inches of teak, the breastwork, armored with twelve-inch plate, backed by eighteen inches of teak, rises to the height of six feet three inches above the upper deck. The deck, extending on either side of the breastwork, consists of one-inch plates covered by two-inch plates, and over this six inches of oak planking. The revolving turret, centrally placed, rises out of the breastwork chamber with a space of six inches between it and the surrounding glacis-belt, which is three feet in breadth. The general thickness of its armor, backed by seventeen inches of oak, is twelve inches; at the ports, fourteen-inch plates and fifteen inches of oak, with one and one-half inches of skin, then vertical girders five inches in depth, and, finally, a mantlet skin of quarter-inch iron. The armament consists of two twelve-inch 25-ton guns. The ram projects twelve feet beyond the stem.

The armament of the "Hotspur," a ram, was originally one 25-ton gun, mounted upon a revolving platform in a fixed turret pierced with three port-holes, one forward and one on each side. But for this will be substituted two 25-ton guns, mounted in a revolving turret armored with steel-faced plates.

For experimental purposes, the 25-ton gun of this ship was brought to bear upon the strongest part of the "Glatton's" turret. The results, as summarized by the engineer, are given. Passing from the "Rupert," a ram of modified "Hotspur" type, of larger dimensions and thicker armor, the "Cyclops," "Gorgon," "Hecate," and "Hydra," double-turreted monitors with breastworks armored with plates from six to ten inches thick, carrying four ten-inch 18-ton guns, with brief notices of less important armored vessels, it is remarked that the coast vessels are engined on the old system, the "Cyclops" and "Hydra" excepted, the engines of which were the first of Elder's compounds introduced into armored ships.

Successive extensions of the methods adopted to increase the stability of the coast defenders, as compared with the simple monitor type, resulted in the construction of such formidable sea-going turret-ships as the "Devastation," the first mastless British sea-going ship built from plans originally prepared at the Admiralty in 1869.

Of the low free-board type, two hundred and eighty-five feet in length, sixty-two feet three inches in breadth, and with a mean draft of twenty-six feet, double-bottomed and of cellular structure, strengthened for ramming, divided by water-tight transverse bulkheads, her sides, which, except right forward, rose to a height of four feet six inches above water, were protected amidships by twelve-inch armor. On the middle of the upper deck was raised a breastwork-platform about one hundred and fifty feet in length. In two turrets, one at each end of this breastwork, were to be mounted, in pairs, four 25-ton guns, about

fourteen feet above the water-line; the turrets protected by armor twelve and fourteen inches thick, the breastwork by armor ten and twelve inches thick. A forecastle extended forward from the fore end of the breastwork, at a height of nine feet three inches above the water. In the wake of this forecastle the armor on the sides was only six inches above the water-line, corresponding to the level of the armored deck. All necessary hatchways and openings into the ship led up by iron trunks to a light, flying deck extended between the two turrets and somewhat overlapping each. Twin-screws, each driven by a separate pair of engines with an aggregate of five thousand six hundred horse-power; speed, 12.5 knots.

The great question of the day being the comparative merits of turret and broadside armaments for sea-going armored ships, and the then chief constructor of the navy being opposed to the turret system, an order had been given for the "Captain," a turret-ship, to be designed and built by a private firm.

The "Devastation" represented Mr. Reed's views of what a sea-going monitor should be, and she may be regarded as having been designed to compete with the "Captain." Low sides were adopted, but not in combination with rigging and sails, as was the case with the "Captain." The "Captain" was launched in March, 1869, and towards the close of 1870 made one or two successful cruises. But during the night of the 6th of September, off Cape Finisterre, in an ordinary squall, she capsized and foundered. This led to a critical investigation by a special committee, consisting of many of the highest professional and scientific authorities in England, of the designs of the other armored ships. They reported that ships of the "Devastation" class have stability sufficient to make them safe against the rolling and heaving action of the sea. But, in order to make safety doubly safe, side superstructures were added, formed by continuing the ship's side upward with light framing as high as the top of the breastwork, and continuing the breastwork-deck to the sides. These structures were extended aft on each side a considerable distance beyond the end of the breastwork, adding largely to cabin accommodation. Athwart ship armor-plated bulkheads were constructed to protect magazines and engines, and four 48-ton guns were substituted for 35-ton guns. The engines, direct-acting, trunk type, were contracted for prior to the adoption of compound engines. With full power of six thousand six hundred and thirty-eight horses, her speed was 13.84 knots; with half power, 11.91 knots.

The "Devastation" has proved to be a good sea-boat. Commissioned in 1872, she continued in service until 1879, when she was refitted and provided with special equipments,—Whitehead torpedoes, electric lamps, and a steam cutter suitable for patrol or for torpedo warfare.

The "Thunderer," sister-ship of the "Devastation," has proved

herself thoroughly seaworthy. On the 18th of November, 1877, during the very height of a gale of unexampled fury even in the English Channel, she made a passage from Portland to Spithead. Although her bow was immersed to a depth of six feet, she lifted readily and shook the water from her decks freely.

The "Neptune," purchased from the Brazilian government in 1878, is a single-screw, two-turreted, sea-going citadel-ship, and affords an example of the application of sail-power to the "Devastation" type. She is barque-rigged. The forecastle, fitted for working the anchors, has an armored bulkhead across the forepart, behind which are placed two seven-inch guns. Since the purchase, 38-ton muzzle-loaders have been substituted for 35-ton Whitworth breech-loaders, and 12-ton Woolwich guns for the 7-ton Whitworth guns. On trial, her indicated horse-power is eight thousand eight hundred and thirty-two, the greatest ever developed by any single engine; speed on trial, 14.65 knots. The armored pilot-house is forward.

The "Dreadnaught." Soon after the keel of this ship was laid, in 1870, work was suspended, awaiting the report of the committee on ships' designs. In 1875 she was launched. The modifications resulting from the experience of the trials of the "Devastation" were important. Longer than the "Devastation" by thirty-five feet, with an increase of beam of one foot seven inches, and of fourteen hundred and ninety-nine tons more displacement, an increased weight of armor could be borne. Instead of building a breastwork amidships, some one hundred and eighty-five feet long, on the deck of the armored hull, with a passage of say ten feet between it and the sides of the vessel, as was done in the "Thunderer" and other low free-board ships, the sides of the "Dreadnaught" were built up flush to the top of the upper or turret deck and armored with solid plates eleven inches thick, except at the ends and abreast the bases of the turrets, where it was increased to thirteen and fourteen inches. The armor-belt around the vessel, eleven inches thick on the water-line, tapers to eight inches at five feet below water, where it stops. It also tapers above water fore and aft the citadel, as well as towards the ends. Forward of and abaft the citadel it rises four feet above the water, and is intended solely to protect the vital parts of the hull. All parts above it are destructible, and may be riddled with shot without detriment to the fighting or sea-going qualities of the vessel. The turrets rise through the plated citadel deck to a height of twelve feet from the base or revolving deck-platform. They are built with two courses of 7-inch plates and two courses of teak of six and nine inches thickness, the latter between the plates. The shell consists of two $\frac{3}{4}$-inch plates, bolted together and riveted to the framing. The hull has the usual double bottom, and the general system of division and water-tight doors is adhered to, including the longitudinal bulkhead, which extends to within forty feet of stem and

stern. The sides of the pilot-house, twelve feet by ten feet, are of 14-inch armor; the roof is plated with steel ⅜-inch thick. Our author enumerates the appliances by which the various operations incidental to the management of this great machine are effected. The pilot-house is described as crowded with mechanism, to enable the captain to manœuvre and fight the ship under cover, without being under the necessity of stirring from the spot. The engines are of the compound type, an independent set to each of the twin-screws. The six-hour trial of the motive machinery was made in January, 1877. "In order to show the superiority of the 'Dreadnaught's' compound engines, from an economic point of view, it may be mentioned that had she been fitted with engines of the common type, as those of the 'Thunderer,' she would have to burn seventy-six tons a day more fuel to develop the same power as on the day of trial." Her armament consists of four 38-ton 12½-inch unchambered guns, the maximum charge one hundred and sixty pounds of powder, and projectile of eight hundred pounds.

Chief Engineer King, comparing the "Dreadnaught," "Devastation," and "Thunderer," says, "The 'Dreadnaught,' then, may be considered, next to the 'Inflexible,' the most powerful British ship-of-war ever floated."

The "Inflexible," designed by Mr. Barnaby, Director of Naval Construction at the Admiralty, laid down in 1874 and launched in 1876, is a twin-screw double-turret ship, with a central armored citadel. Length, three hundred and twenty feet; breadth, seventy-five feet; freeboard, ten feet; draft, twenty-five feet five inches aft; displacement, eleven thousand four hundred and seven tons.

In this ship the principle of submerged ends with unarmored superstructure is applied, by which the sharpness necessary to the attainment of high speed and the buoyancy to support the weight of iron applied without inconvenient increase of draft are obtained, the decked superstructure not interfering with the firing of the guns. Outside the citadel, the lower-deck beams are covered with iron three inches thick. This deck, six to seven feet under water, is depressed at the fore-end so as to meet that part of the bow intended for ramming. There are four decks: lower, middle, upper, and superstructure decks, the last being a middle-line erection, placed forward and aft above the upper deck, for working the ship. The hull is divided, by means of transverse and longitudinal bulkheads, into no less than one hundred and thirty-five water-tight compartments. The citadel, inclosing the engines and boilers, the turrets, the hydraulic loading-gear, the magazines, and, in fact, all the vital parts of the vessel, is one hundred and ten feet in length, seventy-five feet in breadth, and is armored to the depth of six feet five inches below the water-line, and nine feet seven inches above it. The sides of the citadel consist of an outer thickness of 12-inch armor, strengthened by vertical angle-iron girders eleven

inches wide, placed three feet apart, the space between them being filled in with teak backing. Behind these girders, in the wake of the water-line, is another thickness of 12-inch armor, backed by horizontal girders six inches wide, and supported by a second thickness of teak backing. Inside this are two thicknesses of 1-inch plating, to which the horizontal girders are secured, the whole of the armor backing and plating being supported by and bolted to transverse frames two feet apart, and composed of plates and angle-irons. Above the water-line the armor is twenty inches, in two thicknesses of twelve inches and eight inches, and below the water-line sixteen inches, in two thicknesses of twelve inches and four inches. The teak backing varies inversely as the thickness of the armor, being respectively seventeen inches, twenty-one inches, and twenty-five inches, forming with the armor a uniform wall forty-one inches thick. The armor on the fore bulkhead of the citadel is the same in every respect as that on the sides; but that of the rear bulkhead is somewhat thinner, being of the respective gradations twenty-two, eighteen, and fourteen inches, with teak backing a uniform thickness of thirty-eight inches.

The armor-shelter for the protection of the officers manœuvring the ship is in the shape of a cross, and is plated with iron twelve inches thick. The turrets are *en échelon* with the walls of the citadel. The four 80-ton guns of both turrets can be discharged simultaneously right ahead or right astern, or on either beam, or in pairs towards any point of the compass. The guns of each turret can be projected clear of the ship's side and depressed enough not only to strike a vessel at close quarters below the line of her armor, but even to fire down upon her deck should she be alongside. The walls of the turret are of steel-faced armor of a total thickness of sixteen inches.

Each turret, including guns, weighs not less than seven hundred and fifty tons. The revolution of the turrets is effected by hydraulic machinery, and the guns are mounted and worked on the Rendel system, the most simple and, so far, undoubtedly the best devised.

To preserve stability in case of penetration, the entire space between the shot-proof deck and the middle deck, a little above the water-line, is divided into compartments, arranged partly to carry coals and partly stores packed in water-tight tanks. Next to the sides of the ship the compartments are about four feet wide, and are filled with cork, and inside this again are compartments two feet wide, filled with layers of canvas and oakum. The cork and canvas departments are carried above the main deck four feet and two feet respectively, and thirty feet forward of the citadel and thirty-seven feet aft of it. Since the report of the committee on the stability of the ship was made, additional cork-chambers have been constructed.

In times of peace the "Inflexible" will be brig-rigged, having two steel masts, but no bowsprit, the total contemplated sail area eighteen

thousand five hundred square feet; the fighting rig, two masts for signaling and for crows'-nests, but without yards. Each screw is driven by an independent set of compound engines, with three vertical inverted cylinders each, of the collective power of four thousand horses, giving an aggregate power of eight thousand horses (indicated) for both sets of engines. The bunkers are built to contain twelve hundred tons of coal. When commissioned the "Inflexible" will have on board, for all purposes, thirty-nine engines.

In the course of construction of this ship Mr. Reed expressed the opinion that the cork chambers would be liable to speedy destruction, and that the ship would then be left without stability. A committee appointed to investigate this subject reported that in their opinion the unprotected ends are as well able as the armored citadel to bear the part assigned to them in encountering the various risks of naval warfare, and therefore considered that a just balance had been maintained in the design, so that out of a given set of conditions a good result had been obtained.

The "Ajax," laid down in 1876, and the "Agamemnon," commenced in the same year and launched in 1879, are of the "Inflexible" type, but of reduced dimensions, armor less thick, and the armored deck, outside the citadel, submerged to the depth of five feet ten inches, instead of seven feet. The armament will consist of four 38-ton guns, worked on the hydraulic system, against four 80-ton guns in the "Inflexible"; maximum horse-power, six thousand; speed, thirteen knots.

The "Colossus" and the "Majestic." These two steel sister-ships were laid down in 1879, of the same type as the "Inflexible," and of dimensions between those of the "Ajax" and that ship, but in design and proportion important changes have been made. They will be five feet longer than the "Inflexible" between perpendiculars, but also of seven feet less breadth of beam, the sides to be protected with sixteen-inch steel-faced armor, the turrets, probably, with the same kind of plates; while the exposed decks will be sheathed to the extent of three inches in thickness. The principle of defending stability by cork-space and coffer-dams will receive additional development. These ships will not be rigged, but provided with derricks for hoisting boats in and out. The armament will probably consist of four breech-loaders of about forty tons weight. It is proposed also to mount six light shell-guns on the superstructure, and four or six Nordenfeldt guns. Very stringent precautions are to be observed in dealing with the materials of construction. The ram is formed of two armor-plates arranged so as to be removed. The stem and ram are supported by three-inch armor-plates bent over the stem and rabbeted into it.

The "Conqueror," now building, is a mastless, sea-going, twin-screw, single-turret steel ship, but of a type quite different from any preceding her. She is a citadel vessel, but not to the same extent as those just

described, since she does not depend upon the citadel or upon cork chambers for her reserve of stability in the event of being pierced. After describing this vessel, of which a profile view, plan, and principal dimensions are given, Chief Engineer King says,—

"The leading features of this ship may therefore be said to be, first, that the protection of her vital parts against an enemy's projectiles is so ample that if the stern and upper works, and even the citadel, should be damaged, stability would still be preserved; second, that the unarmored structure, rising high above the submerged vessel, affords comfortable quarters and removes the objections raised against low freeboard monitors. Altogether, the 'Conqueror' is the best specimen of a single-turret vessel yet laid down. Perhaps the principal, if not the only, objection which may be urged against her will be the large size and cost, considering that she carries but two heavy guns, 40-ton breech-loaders, and that they do not have an all-round fire."

The "Duílio" and the "Dandolo" are two powerful Italian armor-clad twin-screw sister-ships, designed in general accordance with the views of the British committee on designs. The "Duilio," commenced at Castellamare in 1872 and launched in 1876, made her trial-trip in January, 1880. These ships are three hundred and forty feet eleven inches long, of sixty-four feet nine inches beam, with a drab aft of twenty-six feet five inches, and a displacement of ten thousand four hundred and one tons. The hull is of iron and steel, on the cellular system, with double bottom upwards of two hundred and thirty feet in length, and is divided both longitudinally and transversely into a great number of water-tight compartments. The central armored citadel, one hundred and seven feet in length, descends to five feet eleven inches below the water-line. Forward and aft of this citadel the decks, four feet nine inches under water, are defended by horizontal armor. Over this citadel is built a second central armored compartment, inclosing the bases of the turrets and the mechanism employed in loading and working the guns. The turrets are placed diagonally at each end of the citadel, as in the "Inflexible," rendering it possible to discharge three guns simultaneously parallel to the line of the keel. Only the central portion of the ship and the two turrets are protected by vertical armor. The armor of the central portion of the vessel is 21.65 inches in thickness, on the upper redoubt and turrets 17.71 inches, backed by 23.62, 19.68, and 11.81 inches of wood respectively. The decks are protected by horizontal armor of iron and steel, the former under the latter. The original intention was that the armament should be composed of two 60-ton guns in each turret; subsequently it was decided to employ 100-ton guns, which were manufactured by Sir William Armstrong,—muzzle-loaders. The "Duilio" is armed with a heavy projecting ram. The motive machinery consists of a pair of trunk engines to each screw; steam supplied by the ordi-

nary box-boilers. On trial, with seven thousand seven hundred and ten indicated horse-power, a speed of fifteen knots was attained.

The engines of the "Dandolo" will consist of a pair of inverted vertical compound engines to each of the two screws; the pressure of steam to be sixty pounds per square inch; the maximum indicated horse-power, seven thousand nine hundred.

The two great ships "Italia" and "Lepanto," the former recently launched at Castellamare, the latter in process of construction at Leghorn, were laid down in 1877–78. From an outline view, plans of the decks, and sections of the "Italia," furnished by the Italian Minister of Marine, a very clear idea of the type and subordinate disposition of parts is obtained, and, with the description given by Chief Engineer King, it is easy to see the wide difference between this vessel and other great ships of the world.

The "Italia" is four hundred feet long, seventy-two feet nine inches in breadth at the water-line, with a draft aft of thirty feet and six inches. Her displacement at the lead-line is thirteen thousand four hundred and eighty tons. Side-armor is entirely dispensed with. Four 100-ton breech-loaders are to be mounted on the upper deck in pairs *en barbette* (worked on Rendel's system, as in the "Téméraire"), firing over an armored parapet seven feet six inches in height, forming an oblique oblong inclosure, in the circular ends of which the pairs of guns are placed diagonally with respect to the ship, in order to permit firing parallel to the line of the keel, ahead, or astern, or to any point in pairs, and all on either beam.

The hull is of steel sheathed with wood, double-bottomed, and of cellular structure. Two longitudinal bulkheads more than two hundred and fifty feet long, with transverse bulkheads, divide the hull into fifty-three large compartments, which are again subdivided by four water-tight decks, the first of which is the armored deck, five feet six inches below the water-line, at the sides of the ship, and protected by three inches of iron or steel. It is incurvated at both extremities, extending forward to the point of the ram. Immediately above this deck is another, six feet above the water-line, of thin iron or steel and covered with wood. The side compartments between these decks are divided into water-tight cells to be filled with cork as in the "Inflexible," with this important difference, that no armor protects the side. On the third or battery-deck are to be carried twelve six-inch guns. Seven feet above this deck, twenty-five feet above the water-line, is the deck supporting the armored parapet protecting the heavy guns, which are supplied with ammunition from below the armored deck through armor-plated cylinders of nine feet internal diameter. Chief Engineer King, commenting upon the rejection of side armor, says, "Remembering that the whole of the controversy raised by Mr. Reed, late chief constructor of the British navy, about three years ago, respecting the

'Inflexible,' related to the limitation of her armor to the central portion of the ship, it will appear a bold defiance of the principles laid down by that gentleman to abandon side-armor altogether as a means of preserving stability when the ship is pierced at the water-line."

The engines will consist of two sets of the three-cylinder, vertical, inverted type to each of the two screw-propeller shafts; the cylinders of equal diameters, applied to cranks set at equal angles. The steam- and exhaust-valves are so arranged as to allow the engines to be worked either on the compound or the non-compound system, as desired. It will be only in exceptional cases that the necessity for the full speed of the ship will require all the twenty-six boilers and the twelve steam cylinders. The combined engines should, as estimated by Chief Engineer King, develop an indicated horse-power of not less than fifteen thousand, and a speed of sixteen knots, at sea,—a greater power than ever before placed in a single ship, and a speed greater than ever attained by any war-vessel afloat, the "Iris" and the "Mercury" excepted.

In briefly reviewing the history of the French navy, Chief Engineer King says, "If we examine the armored fleet of the French built prior to 1872, it will appear that they not only perpetuated the forms and approximate dimensions of their unarmored steam-fleet in their armored ships, but they also clung pertinaciously to the old broadside system of armament. True to their national instincts of systematic classification, they laid down simultaneously many ships of one design, or differing but in minor details." In 1872 a programme of reconstruction was adopted, in which English types, more or less modified, were taken as models and iron substituted for wood, which had been almost exclusively employed. In the years 1872 and 1873 twenty ships were laid down from the designs of the most eminent engineers, and between 1873 and 1878 there were commenced thirty-nine other vessels of different classes, including some of the largest and most powerful ironclads, besides ships of the rapid type and a large number of torpedo-boats. Descriptions are given of the "Richelieu," "Colbert," the "Friedland," and "Trident," launched during the years 1874, 1875, and 1876, not as heavily armored as ships of later construction, but in other respects formidable vessels; also of the "Redoubtable," launched in 1876, and of the "Dévastation," designed by M. Le Busey and launched in 1879. The latter ship is three hundred and eleven feet eight inches in length, sixty-seven feet and one inch in breadth, with a mean draft of twenty-four feet; displacement, nine thousand four hundred and fifty-four tons. The hull is of steel, except the skin-plating, which is of iron, has a double bottom, and is divided by longitudinal and transverse bulkheads. The features which distinguish this type of ship are the peculiar shape of the citadel, the great guns, carried on the broadside, and the system of working them. The citadel, plated with 9.5-inch armor, is of the breadth of the ship,

with parallel sides about 37.5 feet in length, and circular ends of about thirty-six feet radius. In each quadrant is a 12.6-inch breech-loading gun, 15.5 feet above the water-line, worked by hydraulic machinery. These guns, the heaviest yet mounted in broadside, are trained by chains led through the deck to presses below. In two barbette half-turrets, rising above the citadel, one on each side, are two 10.6-inch breech-loaders, about twenty-seven feet above the water-line; and on deck two of the same calibre, with eight of 5.5 inches, which are also breech-loading. The maximum thickness of armor-belt on the water-line is fifteen inches.

As the largest and most heavily armored ship ever built by the French, having no counterpart in the British or any other navy, the "Admiral Duperré" receives special consideration. Almost flat-bottomed and considerably curved above the water-line, "tumbling home," her lines forward are very fine. The hull, divided by a longitudinal and many transverse bulkheads, contains, including double bottom, nearly two hundred cells. The armor is limited to a water-line belt, with a maximum thickness of 21.6 inches; to an armored deck, flush with the upper edges of the water-line belt; and to four armored towers containing the heavy guns; the battery between decks and everything above the armor belt, except the towers, unprotected. Of the four fixed, open towers, each containing one 12½-inch breech-loading rifle, two are placed forward, one on each bow, protruding beyond the ship's side, one in the middle of the quarter-deck, and one abaft the mizzen-mast, all partially sheltered from a plunging fire of small-arms or machine-guns by bridges or hurricane-decks. Besides the four heavy guns in the towers, there are fourteen breech-loading rifles, of 5.5-inch calibre on the broadside amidships, between decks. An additional weapon is the ram. Chief Engineer King, after stating the advantages claimed for the "Admiral Duperré," enumerates the disadvantages; and as there are no ships of her type in other navies with which to compare her, takes for that purpose one of a different type, but having very nearly the same displacement, draft, and thickness of armor on the water-line, with power of engines not much greater, and, like her, designed for ocean work,—the Italian mastless, sea-going ship "Dandolo," now building at Spezzia, and thus concludes: "In the event, however, of a fair hit by a projectile from the 100-ton gun there can be no question as to the result, it being evident that no armor, whether designed to protect ships or forts, has ever been constructed capable of resisting such a blow."

The "Du Guesclin," also laid down in 1876, is an "Admiral Duperré" of reduced dimensions. Her hull is of steel sheathed with wood; thickness of armor-belt on the water-line ten inches, on the towers eight inches, and on the deck, flush with the top of the belt, two inches. Her armament consists of four 9.4-inch, one 7-inch, and six 5.5-inch

guns, all breech-loading rifles. The propeller-shafts protrude a great distance beyond the brackets, under the counter, which support the shaft-bearings.

About the year 1860 it was determined by the German authorities to increase their navy by the addition of several ships. Two, the armor-belted "Kœnig Wilhelm" and the "Arminius," now obsolete, were built in England, others in France, and one was commenced in Prussia. After the close of the Franco-Prussian war of 1870 a naval policy was adopted and steps taken to provide armor-clad vessels suitable to the various requirements of defense and attack at home or abroad. In pursuance of this policy there have been completed since the year 1873 five armored frigates,—the "Kaiser" and the "Deutschland," constructed in England from the designs of Mr. E. J. Reed, C.B., M.P.; the "Grosser Kürfürst" and the "Friedrich der Grosse," built at the Imperial dock-yards, and the "Preussen," constructed at Bredow, the drawings and specifications for the three last being prepared at the Admiralty in Berlin. Of six armored corvettes proposed, one, the "Sachsen," is finished, two others, the "Baiern" and the "Wurtemburg," are approaching completion, and a fourth is on the stocks.

Monitors have not, as was originally designed, been ordered, but a new type of armored gunboats has taken their place. The "Kaiser" and the "Deutschland" were the last ships ordered from a foreign country. Sister-ships, they are of the broadside central-battery type, and in general features similar to the British frigate "Hercules." They are built on the bracket-plate system, and are divided into compartments by water-tight transverse bulkheads. The "Preussen" and "Friedrich der Grosse," armored sea-going turret-ships, are of a type similar to the British ship "Monarch," but differ in dimensions. The details of construction of the "Preussen" are very fully given.

The "Sachsen" was the first of the second group of German armored ships, launched in 1877, three others of the same class being in process of construction. Length, two hundred and thirteen feet three inches; extreme breadth, fifty-one feet four inches; draft, nineteen feet eight inches; displacement, seven thousand one hundred and thirty-five tons. In this vessel the principle of sub-mergedends is applied, in conjunction with cork girdle inside forward and abaft the casemate.

The system adopted by the Germans in this class of vessels to obtain an all-round fire, as well as a powerful bow-fire, for their guns is illustrated in the "Sachsen." The rectangular casemate, more than half as long as the ship, plated with ten inches of iron, is covered by a two-inch iron deck, upon the forward end of which is a pear-shaped fixed tower, containing two 10¼-inch Krupp guns; and upon the after end is a fixed rectangular parapet, with rounded corners, in which are mounted four guns of the same calibre, also to fire *en barbette*. Four can be fired from directly ahead to thirty-five degrees abaft the beam; two from

directly aft to the same number of degrees forward; and four can concentrate their fire upon any one point from the broadside. The ironclad deck forward of and abaft the casemate is six feet six inches below the water-line. On her trial trip a speed of fourteen knots was attained.

Of the Turkish armored vessels, the "Avni Illah" and a sister-ship, designed by Mr. George C. Mackrow, present the remarkable feature of a citadel in the form of a double hexagon. The two principal hexagonal parts, in each of which two 12-ton Armstrong guns are mounted, are united by parallel side-armor, as the "curtain," in fortification, connects the flanks of bastions. By this means, the ship's sides being deeply recessed, a converging fire of two guns is obtained ahead, astern, or on the broadside. The forward- and after-faces are circular and without ports.

In the "Tegethoff," recently completed, the most important fighting-ship in the Austrian navy, the central battery projects over the sides of the vessel between four and five feet, the spread beginning at eighteen inches above the water and terminating at a height of six feet, and is a modification of the rectangular form. Its length, about one hundred and eleven feet; extreme breadth, seventy-one feet. The forward part presents three faces, two inclined at an angle of forty-five degrees with the keel, and one, nine and a half feet long, connecting these at right angles to the keel. Immediately abaft this face rises a strong pilot-tower. The after-face is circular, with a radius of about fifty-four feet, substending an angle of fifty-five degrees, and is connected with the side-armor by concave circular faces of about seventeen feet radius, instead of the usual plane-face, in which are the ports of the two after guns. The two forward guns fire through ports in similar concave faces, with chords of about seventeen feet, connecting the side-armor with the forward plane-faces. The ports of the two intermediate or broadside-guns are also in concave circular faces of fifteen feet chord. By this means the six eleven-inch Krupp guns are brought well inboard, an advantage in projecting batteries as tending to diminish the inclining moment. A transverse armored bulkhead, abaft the two foremost guns, divides the armored citadel, as in the "Alexandra."

A belt of armor extends from the stern to within about thirty feet of the foremost perpendicular, where it terminates in a transverse armored bulkhead, and in a stout iron deck, going forward to the stem at about seven feet below water. This iron stem, supported by the deck near the point of the ram, serves for ramming purposes.

In the descriptions of armored vessels of Russia, including ten monitors of early date on Ericsson's plans, are those known as the "Four Admirals," of the Coles' rigged turret-ship type; the "Knaz Minim," constructed as a rigged turret-ship on the Coles' plan, but altered, in consequence of the loss of the British ship "Captain," to a central-battery ship; the "Peter the Great," a mastless ship, designed

to compete with the "Devastation," but subsequently modified, resembling somewhat the "Dreadnaught;" the broadside-belted vessels "Duke of Edinburgh" and the "General Admiral," both of recent construction, of iron sheathed in wood and coppered, and noted as embodying the original conception of the water-line armor-belt. Illustrations of the remarkable circular armored ships invented by Vice-Admiral Popoff are given, with noteworthy points of Mr. Reed's lectures upon them and the author's views. The "Peter the Great" and the "Knaz Minim" are cited as the only two vessels on the list of Russian seagoing armored ships up to the modern standard of fighting efficiency.

A profile view and plan of spar- and gun-deck of the "Almirate Cochrane," sister-ship of the "Blanco Encalado," designed by Mr. Reed and built in 1874–75, convey a clear idea of the type of ship, her form of ram, her armor, and the disposition of the six 12½-ton Armstrong guns which she carries.

The after-half of the central armored citadel projects beyond the side, permitting the two middle guns to fire within twenty degrees of the line of the keel and thirty-five degrees abaft the beam, the two forward guns right ahead, the two after right astern, all having broadside-fire. A profile view and plan accompany also the description of the famous "Huascar," captured from the Peruvians after a desperate struggle against overwhelming odds, as a comparison of the ships engaged clearly shows.

In the "Foo-so," the first armored ship built in England for Japan, designed by Mr. Reed and launched in 1877, a new system of framing was introduced, and the armor was attached to the hull by brackets outside the frames of the ship. The breadth of the octagonal citadel, in which are mounted four 15½-ton guns, is equal to its length, and it projects, by the thickness of its armor, beyond the side of the ship, supported by brackets. Its four oblique faces make angles of about thirty degrees with the keel, permitting the forward and after guns to fire within thirty degrees of the line of the keel and ten degrees abaft and forward of the beam respectively. Two 6.7-inch 5½-ton Krupp guns, one on each side of the upper deck, over the central part of the citadel, fire through forward, broadside, or after embrasures.

In the "Heligoland," a Danish casemated, central-battery ship, the citadel is a combination of the octagonal and circular forms. The after oblique faces, united by a transverse plane face, make an angle of about forty-five degrees with the keel, the forward about thirty degrees, united by an arc forming the front of the citadel, within and above which rises a fixed circular turret; at each of the four oblique faces is mounted a 10½-inch Krupp rifle, and in the barbette turret a 12-inch Krupp rifle.

The Portuguese "Vasco de Gama" has a fixed octagonal turret, as it is called by the designer, about forty-five feet in breadth, and the same in length. The two after oblique faces, united by a transverse face,

make an angle of thirty-six degrees, and the two forward oblique faces, united by a circular face, an angle of forty degrees with the keel. The armament consists of two 10¼-inch, one 6-inch, and two 40-pounder guns.

We pass now from these great engines of destruction to the less powerful, but to this country important, unarmored cruising men-of-war, which, in the words of Chief Engineer King, should possess, "as the first essential element of power, a speed sufficiently high to overtake any vessel on the ocean desirable to capture, and to escape from any powerful fighting-ship it might be desirable to evade."

To reports originating in this country, and published in England, of the extraordinary speed and power to be developed in the "Wampanoag," and other vessels of that class, is attributed the immediate incentive to construction of the frigate "Inconstant," launched in 1868, three hundred and thirty-three feet long, of fifty feet beam, and 23.5 feet mean draft, built of iron, sheathed with wood and coppered, followed by a sister-ship, the "Shah," and by the "Raleigh," of reduced dimensions, both launched in 1873; by the "Boadicea," the "Bacchante," the "Euryalus," and "Rover," corvettes of the first class, all of smaller dimensions than the "Raleigh," and engined on the new system, with three-cylinder compound engines.

The "Rover" is regarded as approaching in size and type a class of vessels greatly needed in our own navy. She is two hundred and eighty feet long, forty-three feet six inches in breadth, with a draft forward of seventeen feet six inches, aft twenty-three feet two inches; displacement, three thousand four hundred and ninety-four tons.

The hulls of the present fast unarmored cruising-ships of the British navy larger than the "Opal," a vessel of two thousand one hundred and sixty-two tons displacement, "are of iron and steel, and they are built with improved structural arrangements for securing great strength to withstand the immense engine-power put into them, and to endure it for any desirable length of time. The bottoms are sheathed with wood and covered with copper or zinc to prevent fouling. They carry a large spread of canvas, are provided with lifting-screws, and are in all respects fitted to keep the sea." They have speed superior to the cruising-ships of any other navy, are reputed to be excellent sea-boats, fast under sail, and are armed with rifled guns, some of which are of heavy calibre. The first nine on the list range in speed, at the measured mile, from 14.5 to 16.6 knots. Of those swift (rapid) armed steel dispatch-vessels, "Iris" and "Mercury," full descriptions, with profile and plan, are given, with much that is interesting relative to their engines and speed of nearly nineteen knots.

After these come the steel-and-iron corvettes, with frames, beams, and knees of iron, outside planking of wood, generally teak, as in the "Garnet" and "Canada" classes, and the sloops and gun-vessels of

modern type, supplemented by a description of the composite system of construction.

Of the French unarmored cruisers are described the ship-rigged frigates "Duquesne" and "Tourville," both of the rapid type. Of the latter ship, launched in 1876, it is said that with many features of the hull have been accepted the errors admitted by the British authorities to exist in the "Shah." The "Duguay-Trouin," a corvette of the first class, launched in 1877, is characterized as of a type less costly to build and maintain and far more useful than the type "Duquesne." An interesting and instructive comparison of the "Duguay-Trouin" and "Rover," with other dimensions and other data of the two ships, are given.

It may be briefly stated that in the French unarmored ships is sought the greatest possible bow-fire, with moderate power in stern-chasers, the heaviest guns being carried on protruding sponsors or half-turrets, from which they are fired *en barbette* over low bulwarks. The straight, old-fashioned bow has given place, as a rule, to the ram-bow, and in no case are the propellers arranged for lifting. Want of space forbids more than mere reference to the fact that France, Russia, Germany, and Italy are rapidly increasing the numbers and efficiency of their unarmored cruisers.

It is well known that the United States, while recognizing the rapid increase in naval power of other countries, has not yet taken steps to regain the relative position occupied before this general reconstruction of navies began.

The navy of the United States, once in advance of all others in model and armament, does not now possess a single armored sea-going ship, has but few modern cruising vessels, and no armament of modern rifled guns. Of coast defenders (of the Ericsson type) there are, exclusive of the "Puritan" and "Dictator," three classes.

The most important are those of the first class, now building, four in number. These vessels are two hundred and fifty feet in length, fifty-five feet in breadth, and have a mean draft of fourteen feet, with a displacement of about three thousand eight hundred and fifteen tons.

The hulls are of iron, double bottomed, and divided by water-tight bulkheads into compartments. They have compound engines and twin-screws, and are expected to attain a speed of twelve knots. Important alterations in the plans of these vessels have been recommended by a board of officers appointed in April, 1880.

A very clear idea of their efficiency, as compared with foreign vessels, with or without the proposed alterations, may be obtained by consulting the description of the "Miantonomah," one of this class, given in detail and illustrated by plans in connection with the comments of Chief Engineer King, who contrasts this vessel with the "Glatton," "Conqueror," and "Tonnerre."

Of unarmored cruising-ships, the "Trenton," second rate, is the most important. The hull is of wood, has a ram-bow, and is ship-rigged. Length between perpendiculars, two hundred and fifty-three feet; extreme breadth, forty-eight feet; draft aft, twenty feet eight inches; displacement, three thousand nine hundred tons. She is propelled by a single screw, driven by a three-cylinder compound engine. Steam pressure in boilers, seventy pounds; speed, fourteen knots. Her armament consists of eleven 8-inch muzzle-loading rifles, which were converted on the Palliser system from 11-inch cast-iron smooth-bores; also four light guns for saluting purposes. Four of the rifles are mounted on each broadside of the gun-decks, two on the bow on the spar-deck, and one as a stern-chaser on the same deck.

After the "Trenton," the cruising-ships of the most value at present afloat are five of the "Vandalia" class, commenced in the navy-yards in 1872–73. They are all wood-built and ship-rigged. The length of each is two hundred and sixteen feet, breadth thirty-eight feet, and displacement nineteen hundred tons, except the "Vandalia," which has more breadth and displacement. The engines are of the horizontal back-acting type, converted from simple into compound engines; steam-pressure, eighty pounds. The armament is carried on a single open deck between the forecastle and poop, there being no stern-chaser or bow-gun, except one light Parrott mounted above the forecastle.

Comparison between the "Vandalia" and H.B.M. ship "Garnet," one of a class, the dimensions and particulars of both being given, shows several important advantages possessed by British cruisers.

The armament of the "Garnet" is composed of modern rifle-guns of long range and great penetrating power, two guns firing on a line with the keel, one at the bow the other at the stern. The greatest speed reported on the trial of the "Garnet" was thirteen knots, that of the "Vandalia," twelve knots; but the "Quinnebaug," of the same class, attained a speed of thirteen and two-tenths knots. The record of the "Vandalia" affords, however, a good illustration of the efficiency of the type of machinery employed in her. Commissioned in 1875, she made a three years' cruise and returned in good order, having steamed twenty-six thousand two hundred and thirty miles. She was not detained a single day in port on account of repairs to engines or boilers, or for work required in the engineer's department.

After war-ships are given, with equal fullness, organization, *personnel*, naval expenditures, dock-yards, etc., of the great powers.

One of the most interesting chapters of the book is that on recent naval progress in China. On the authority of Captain Bridge, R.N., it is stated that "millions have been already spent in the construction of war-steamers of modern type, and in the establishment of dock-yards and arsenals, in which munitions of war of all kinds may be produced." And referring to the armaments of new Chinese gunboats constructed

in England, Chief Engineer King says, "It will thus be seen that China, the "effete" nation of the East, but just entered in the race between modern naval powers, has already actually put to sea more powerful guns than has any other nation on the globe, for the English "Inflexible" and the Italian "Duilio," carrying 80-ton and 100-ton guns respectively, are not yet ready for service, while the heaviest guns now mounted afloat by the French, Germans, and Russians burn smaller charges and have less power than the guns on board these gunboats,"—a power due to the employment of the "air-space," and a corresponding increase of length of bore.

The actions in which ironclads or armored vessels have been engaged are too few to afford more than indications of what may be anticipated in such contests. The action of Lissa, between the Austrians and Italians, of the "Shah" and the "Huascar," and of the "Blanco Encalado" and "Almirante Cochrane," opposed to the "Huascar," are discussed. Of the latter Chief Engineer King says, "Some lessons may be drawn from this action that are well worth study. Foremost among these is the great value of superior speed, of twin-screws, and handiness of steering apparatus efficiently protected, and light draft."

The improvement of ordnance, which has kept pace with that of armored ships, is traced from the successful welding and application of the wrought-iron coil by Sir William Armstrong to the results attained with the aid of the air-space at the present day. The Armstrong 100-ton muzzle-loading gun, of which drawings, furnished by the Elswick firm, are given, is described; and reports, accompanied by drawings, of results of experimental firing at armor-plates of iron and of steel, mounted on "framing" representing that of the "Duilio" and "Dandolo," are also given, with results of experiments made after chambering the gun and enlarging the bore.

Very full accounts, illustrated by drawings, are given of experimental work at Woolwich, embracing details of trials of guns and targets.

The admirable guns of Herr Krupp are also fully described with illustrations.

It may be said that hardly any information on this important subject could be desired that is not to be found in these descriptions, plates, or tables. Of the latter, there is one showing approximately the dimensions, charges, performances, etc., of the principal service and experimental naval guns existing at the beginning of 1880.

Of especial interest and importance is the subject materials for ships of war. First is shown the striking superiority of iron and steel to wood for ship-building, by an array of facts absolutely overwhelming.

As to the relative values for this purpose of iron and steel, referring to the recent production of steel especially adapted to ship-building, and its successful application so far as strength is concerned, leaving only

durability to be yet tested, but with the fair assumption, from its known properties, that the life of steel ships will considerably exceed that of iron-built ships, the conclusion is reached that, "all things considered, it is highly probable that steel will at no distant time have almost entire possession of the field as a ship-building material, and, now that its claims are fairly recognized, will supersede iron as rapidly as that material has taken the place of wood."

Equally well determined is the superiority of the compound engine. So evident was this to Chief Engineer King, after personal investigation of the subject in Great Britain, that in his annual report as chief of the Bureau of Engineering in 1871 he said, "The field of observation in this direction has been thoroughly gone over, the subject carefully investigated, and the Department is informed of the extent of European operations and results, of which a brief outline has been given. The information is positive, and there can be no hesitation in recommending that all cruising steamers for the navy hereafter put afloat be engined on the compound system."

In 1872 a special committee, consisting of sixteen of the most distinguished naval officers, naval architects, and engineers in Great Britain, earnestly recommended, in a report presented to Parliament, that the use of compound engines should be generally adopted in ships-of-war thereafter to be constructed, and applied, whenever it could be done with due regard to economy and to the convenience of the service, to those already built.

From the date of that recommendation to 1877 there had been designed and ordered to be constructed nine armored ships of large size, twenty-three unarmored corvettes, twelve unarmored sloops, two armed dispatch-vessels, one troop-ship, and twenty-eight gunboats. All these vessels, excepting a few gunboats, have been or are being engined on the compound system; also others of more recent construction.

The success of the compound engine, rendering evident the possibility of attaining practically results which had been deemed merely theoretical, has directed attention to the improvement of the marine boiler. Chief Engineer King, referring to the efforts which have been made to produce a safe and reliable steam-generator, capable of carrying steam a hundred pounds and upwards per square inch, cites numerous experiments and trials of *water-tube* boilers, none of which have proved successful, and says, "It has been estimated that during the seven years ending in 1876 the total cost in Great Britain resulting from the failures of boilers designed to be worked at sea with pressures of upward of one hundred pounds per square inch has nearly reached the enormous sum of one million dollars. Yet this problem will, like others of similar character, be solved."

The extent to which the employment of *auxiliary* means of offense

and defense—torpedoes and machine-guns—has been carried in foreign navies is of special interest; for upon developments or extensions of certain of these means, as affording an equivalent to armored ships, great guns, and fortifications in repelling a foreign foe, much stress has been laid.

The Whitehead-Luppis fish-torpedo, probably the most efficient of its kind, is generally employed. It is made of different sizes, from fourteen to nineteen feet in length, and from thirteen to sixteen inches in diameter at the centre. It is constructed of thin steel, is cigar-shaped, and divided into compartments. The forward part contains the charge, arranged to explode on contact. This compartment is made separately and secured to the main body, which is said to be driven by a set of small three-cylinder engines turning a screw-propeller, compressed air supplying the power. It is guided at a constant depth by a horizontal rudder.[2] It is stated that for two hundred and twenty yards the velocity attainable is twenty-four miles per hour; that one thousand yards can be traversed at the rate of sixteen miles, or four thousand yards at five miles per hour. At the speed of sixteen knots the transit through one thousand yards would occupy about two minutes.

It has been reported that an improved and more powerful type of fish-torpedo, with double screws, was turned out at the Woolwich arsenal in 1879, which can maintain a maximum speed of twenty-six knots for a distance of six hundred yards.

But three instances of the employment of the fish-torpedo in actual warfare are on record, and in two of these they failed. The first, discharged by the "Shah" at the "Huascar," at no great distance, did not strike. In the second, an attempt by the Russians to destroy the "Avni-Illah," moored to a buoy, the torpedoes were towed to a convenient position by boats and started towards the ship, but missed. The third and successful attempt was made by the Russian steamer "Constantine." She discharged a torpedo at a Turkish steamer on

[2] This maintenance of constant depth, the characteristic feature of the Whitehead torpedo, is readily understood when it is remembered that "the different points in a horizontal layer of a fluid mass are subject to the same pressure," and that "the intensity of the pressure at the lower of two points in a still fluid mass is greater than the intensity at the higher point by an amount equal to the weight of a vertical column of the fluid, whose height is the difference of elevation of the points and base an unit of measure."

A horizontal rudder, which is balanced when in the horizontal plane by the pressure due to the required depth and the opposing pressure of an adjusted spring, is sufficient to effect the purpose. If the torpedo descends, the water-pressure increases, the spring yields, the rudder is inclined, and the torpedo moves upward. Passing the plane, the water-pressure diminishes, the rudder inclines in the opposite direction, and it descends. After a few oscillations, each less than that preceding, equilibrium is established, and the torpedo moves at a constant depth. An application of this principle is seen in the Aneroid barometer.—J. M. B.

guard off Batoum, sinking her immediately. The crew were all drowned.

The most successful of the self-propelling torpedoes yet tested in this country is the one invented by Mr. John L. Lay, formerly an engineer officer of the United States navy. The motive-power is carbon ammoniacal gas at an initial pressure of about forty atmospheres. Its movements are regulated by means of an electric current controlled by an operator at a distance. The conducting wires are carried by the torpedo and payed out as it runs.

The Harvey torpedo, which, when towed, may be made to diverge from the course of the vessel, but which retards the speed of a boat, must be given slack-line to permit it to sink before striking, and is now regarded as more difficult to manage and less reliable than the fish torpedo.

In 1872 the "Miranda," a river-launch less than fifty feet in length, built by Messrs. Thornycroft & Co., attained the remarkable speed of nearly sixteen and one-fourth knots; and in 1873 the Norwegian naval authorities ordered a torpedo-launch from that firm. It was fifty-seven feet in length, seven feet six inches in breadth, drew three feet of water, and on the official trial ran 17.22 miles in one hour. She was a fair sea-boat, as proved by her voyage to Norway of one hundred and fifty nautical miles.

With such success at the start, followed by competition, it is not surprising that all the European navies should now be, as they are, supplied with numbers of fast torpedo-boats of several types, some designed solely to eject Whitehead torpedoes, others to carry spar-torpedoes fitted with Captain McEvoy's electric firing arrangement. Skillful builders, as Messrs. Yarrow & Co., have produced equally efficient boats. Dimensions and speed have been increased, as illustrated by one built by the Messrs. Thornycroft for the Danish government, which is ninety-two feet in length, ten feet six inches in breadth, with a speed of twenty-one knots. Clearly-drawn diagrams of these boats of different types are given.

There are torpedo-boats supplied to ships of the British navy sixty feet in length, seven feet six inches in breadth, of three feet draft, and fitted to discharge Whitehead torpedoes. They are designed to have a speed of sixteen knots. In fact, it may be said that there are swarms of these fast torpedo-boats, and some of them make passages of five hundred miles at a mean speed of fifteen knots.

We are told that "torpedo-vessels built for sea-service, light, fast, and handy, especially designed to carry and operate offensive submarine weapons, and provided, as a rule, with rams and machine-guns, but with no other armament, are now considered as a valuable and necessary adjunct to a fleet, and almost every European nation has built or is building such vessels," among others, the German vessel "Ziethen,"

one hundred and ninety-six feet long, twenty-eight feet in breadth, fitted with two tubes sixteen feet long and fifteen inches in diameter, placed in a line with the keel, one forward, the other aft, to project, by compressed air, torpedoes which have sustaining motive-power.

The most remarkable of such vessels is perhaps the "Polyphemus," now building in England,—a nearly submerged hull of peg-top section, two hundred and forty feet long, forty feet broad, built of steel, with a ram-bow, and fitted to discharge Whitehead torpedoes from ports under water right ahead and on the broadside. With a displacement of two thousand six hundred and forty tons, she has engines of five thousand five hundred horse-power.

Having given in "War-Ships and Navies of the World" to the legislator all that is requisite to enable him to appreciate the material naval superiority of foreign powers, and to the architect a scale of power by which to proportion his ships, Chief Engineer King, warranted by the facts, presents his conclusions as to the needs of the United States navy.

To those who believe that this great country needs in time of peace no preparation for war, it may be said that the influence of armament is like that of the lightning-rod, which, by virtue of Franklin's "power-of-points," silently discharges the gathering cloud, and, if there be not time for that, turns aside the bolt.

JOHN M. BROOKE,
Virginia Military Institute.

ARMY CATASTROPHES.

"But pray ye that your flight be not in the winter."—MATTHEW xxiv. 20.

"For the Angel of Death spread his wings on the blast,
And breathed in the face of the foe as he pass'd;
And the eyes of the sleepers wax'd deadly and chill,
And their hearts but once heav'd, and forever grew still."
BYRON'S "*Destruction of Sennacherib.*"

"Cold in that atmosphere of Death."
TENNYSON'S "*In Memoriam.*"

"Hail, horrors; hail."
MILTON'S "*Paradise Lost.*"

"Not by one portal, or one path alone,
God's holy messages to men are known;
Waiting the glances of his awful eyes
Silver-winged Seraphs do him embassies;
And stars interpreting his high behest
Guide the lone feet and glad the failing breast:
The rolling thunder and *the raging sea*
Speak the stern purpose of the Deity,
And storms beneath and rainbow hues above
Herald his anger or proclaim his love:
The still small voices of the summer day,
The red Sirocco and the breath of May,
The lingering harmony in Ocean shells,
The fairy music of the meadow bells,
Earth and void Air—Water and wasting Flame
Have words to whisper, tongues to tell his name.
Once—with no cloak of careful mystery
Himself was herald of his own decree;
The hand that edicts on the marble drew
Graved the stern sentence of their scorner too.
Listen and learn! Tyrants have heard the tale,
And turned from hearing terror-struck and pale,
Spiritless captives sinking with the chain
Have read this page and taken heart again.——"
ARNOLD'S "*Feast of Belshazzar.*"

IN the course of this world's history there are some very few examples of the utter instantaneous and simultaneous destruction of large armies. Two of these may be assigned to the class of miracles, although they are susceptible of explanation through natural causes.[1] The first, the

[1] See Joshua's Relief of Gibeon and Battle of Beth-Horon, UNITED SERVICE, Article viii., Feb. 1880, vol. ii. No. 2.

swallowing up of the host of Pharaoh, B.C. 1491 (Exodus xiv. 26–28), may have been occasioned by the rash adventuring of the Egyptian monarch into the bed of the Red Sea, from which the shallow waters had been driven miles farther than usual by a long continuance of steady, strong northerly winds, operating simultaneously with an extraordinarily low tide. Any observing person who has lived on the shores of a large estuary is aware that at certain seasons of the year violent winds blowing for days together from a particular quarter, down-stream, will lay bare, at low tide, large stretches of beaches and flats, over which, under ordinary circumstances, boats drawing several feet of water can sail or row without impediment.

A great many people suppose that there is no tide in various portions of the Mediterranean, especially the Adriatic, and in the Red Sea, but, at the head of the latter, the tides rise to the height of five feet, and the spring tides even to seven feet. What is more, the depth or height of the water is greatly affected by the wind, and, near Suez, the gulf is sometimes forded by the Arabs at low tide and after the prevalence of northerly winds.

It is well known that Napoleon was nearly lost by venturing on to the sands at a very low tide, and was only saved by an unusual exhibition of common sense which was rendered successful by circumstances.

"At Suez he [Napoleon] visited the harbor . . . and passed the Red Sea in a dry channel, when the tide was out, on the identical passage which had been traversed three thousand years before by the children of Israel. Having refreshed himself at the fountains which still bear the name of the Wells of Moses, at the foot of Mount Sinai, and visited a great reservoir, constructed by the Venetians in the sixteenth century, he returned to recross to the African side. It was dark when he reached the shore; and in crossing the sands, as the tide was flowing, they wandered from the right path, and were for some time exposed to the most imminent danger. Already the water was up to their middle, and still rapidly flowing, when the presence of mind of Napoleon extricated them from their perilous situation. He caused one of his escort to go in every direction, and shout when he found the depth of water increasing, and that he had lost his footing; by this means it was discovered in what quarter the slope of the shore ascended, and the party at length gained the coast of Egypt. 'Had I perished in that manner, like Pharaoh,' said Napoleon, 'it would have furnished all the preachers of Christendom with a magnificent text against me.'"—*Harper's Alison*, I., 518, 1.

The destruction of Pharaoh was undoubtedly miraculous, although attributable to his headlong pursuit across the bed of a gulf, temporarily laid bare, upon which a change of wind and tide brought back the waters with rapid and irresistible fury.

There is another theory which, whether old or new, has only recently been made generally public: that the host of Pharaoh was lost in the Sirbonian bog.

This Sirbonis Lacus or Palus was a vast tract of morass, the centre

of which formed the Sirbonian Lake. This bog may have originally extended well-nigh to the Red Sea, as there are a succession of lakes between the Mediterranean and the Gulf of Suez, the most southerly, adjacent to the ancient canal of Pharaoh Nechu, Birket (lake) Timsah, dry except during the inundations. South of this again, along the same canal, is a salt marsh below the surface of the sea at Suez.

William Smith, in his famous "Dictionary of Greek and Roman Geography," observes: "The limits of the Sirbonian bog have, however, been much contracted in later ages by the elevation of the seaboard and the drifting of the sands, and the lake is now of inconsiderable extent. The Sirbonian region is celebrated in history for having been the scene of at least the partial destruction of the Persian army in B.C. 350, when Darius Ochus was leading it, after the storming of Sidon, to Egypt, in order to restore the authority of Persia in that kingdom. Diodorus (i. 30) has probably exaggerated the serious disaster into a total annihilation of the invading host, and Milton (P. L., ii. 293) has adopted the statement of Diodorus, when he speaks of

> "'—— that Sirbonian bog
> Betwixt Damiata and Mount Casius old
> Where armies whole have sunk.'"

Dr. Brugsch-Bey, in his "True Story of the Exodus of Israel," tells us (p. 93) that the present inhabitants of the district first occupied by the Hyksos have non-Egyptian countenances, resembling the pictures of the Shepherd kings; and intimates that these latter were Arab Bedouins who, in all probability, found their way from the dreary desert through the difficult paths of the great papyrus marsh near the present town of Suez in a northwestern direction, to find the object of their wandering near the town of Pibailos (p. 85).

The most direct route from Egypt towards the East "is that bad road described by Pliny, across the lagoons, the marshes, and a whole system of canals of the region of Sukot" (p. 228).

The fugitive Hebrews (p. 232) and the pursuing Egyptians started from Ramses.

"Exactly as the two fugitives, pursued by the scribe, who dares no longer to continue his route in the desert, had taken the northerly direction towards Migdol and the part called in Egyptian 'The Wall,' in Greek 'Gerrhon,' in the Bible 'Shur,'—all names of the same meaning,—so the Hebrews 'turned,' as Holy Scripture says (Exod. xiv. 2), to enter on the flats of the lake Sirbonis.

"To add a single word to these topographical comparisons would only lessen their value. Truth is simple; it needs no long demonstrations.

"According to the indications of the monuments, in agreement with what the classical accounts tell us, the Egyptian road led from Migdol towards the Mediterranean Sea, as far as the Wall of Gerrhon (the Shur of the Bible), situate at the (western) extremity of the lake Sirbonis. This latter, which was well known to the ancients, had again long fallen out of remembrance, and even in the last cen-

tury a French traveler in Egypt naïvely observed that to speak of the lake Sirbon is speaking Greek to the Arabs (Le Mascrier, *Description de l'Egypte*, 1735, p. 104). Divided from the Mediterranean by a long tongue of land which, in ancient times, formed the only road from Egypt to Palestine, this lake, or rather this lagoon, covered with a luxuriant vegetation of reeds and papyrus, but in our days almost entirely dried up, concealed unexpected dangers owing to the nature of its shores and the presence of those deadly abysses of which a classic author has left us the following description (Diodorus, i. 30):

"'On the eastern side, Egypt is protected in part by the Nile, in part by the desert and marshy plains known under the name of Gulfs (or Pits, τὰ βάραθρα). For between Cœle-Syria and Egypt there is a lake of a very narrow width, but of a wonderful depth, and extending in length about two hundred stadia (twenty geographical miles), which is called Sirbonis; and it exposes the traveler approaching it unawares to unforeseen dangers. For its basin being very narrow like a riband, and surrounded on all sides by great banks of sand, when south winds blow for some time, a quantity of sand is drifted over it. This sand hides the sheet of water from the sight, and confuses the appearance of the lake with the dry land, so that they are indistinguishable. From which cause many *have been swallowed up with their whole armies* through unacquaintance with the nature of the spot, and through having mistaken the road. For as the traveler advances gradually, the sand gives way under his feet, and, as if of malignant purpose, deceives those who have ventured on it, till at length, suspecting what is about to happen, they try to help themselves when there is no longer any means of escaping safe; for a man drawn in by the swamp can neither swim, the movements of his body being hampered by the mud, nor can he get out, there being no solid support to raise himself on. The water and sand being so mixed that the nature of both is changed, the place can neither be forded nor crossed in boats. Thus, those who are caught in these places are drawn to the bottom of the abyss, having no resource to help themselves, as the banks of sand sink with them. Such is the nature of these plains, with which the name of gulfs (βάραθρα) agrees perfectly.'"[2]

"As to the different *manner* of the catastrophe, we may observe that the description of Diodorus throws a new light on the description in Exodus. Pharaoh thought he had caught the Israelites 'entangled' between the sea, the desert, and the bog (Exod. xiv. 2), but when they were led safely through by the guiding pillar of fire, which was turned into darkness for their pursuers, it was the Egyptians that became entangled on the treacherous surface, through which 'their chariots dragged heavily' (verse 25) before the whelming wave, borne in from the Mediterranean, completed their destruction.—ED." [Francis H. Underwood.]

"Thus the Hebrews, on approaching this tongue of land in a northeasterly direction, found themselves in face of the gulfs, or, in the language of the Egyptian texts, in face of the *Khirot* (this is the ancient word, which applies exactly to the gulf of weedy lakes), near the site of Gerrhon. We can now perfectly understand the biblical term Pihahiroth (Exod. xiv. 2), a word which literally signifies 'the entrance to the gulfs,' in agreement with the geographical situation. The indication is finally fixed with precision by another place named Baal-zephon, for (Exod. xiv. 2) 'The Lord spake unto Moses, saying, Speak to the children of Israel, that they turn and encamp before Pihahiroth, between Migdol and the sea, opposite to (lit. 'in the face of') Baal-zephon; ye shall encamp opposite to it by the sea.'"

"The name of Baal-zephon, which (as the eminent Egyptologist, Mr. Goodwin, has discovered) is met with in one of the papyri of the British Museum under its Egyptian orthography, Baali-Zapouna, denotes a divinity whose attribute is not far to seek. According to the extremely curious indications furnished by the

[2] "In this description, and a subsequent passage—see p. 239—Diodorus is generally thought to have exaggerated the fate which befell a part, at least, of the Persian army of Artaxerxes Ochus in B.C. 350, but the discoveries and reasonings of Dr. Brugsch give a far more striking significance to the passage and to Milton's image founded on it,—Paradise Lost, ii. 592-594."—[U.]

Egyptian texts on this point, the god Baal-zephon, the 'Lord of the North,' represented under his Semitic name the Egyptian god Amon, the great bird-catcher, who frequents the lagoons, the lord of the northern districts, and especially of the marshes, to whom the inscriptions expressly give the title of Lord of the Khirot, that is, 'gulfs' of the lagoons of papyrus. The Greeks, after their manner, compared him with one of their corresponding divine types, and thus it was that the god Amon of the lagoons was represented, from the time of the visits made to this region by the Greeks, under the new form of a 'Zeus Kasios (Casius).' The geographical epithet of Casius, given to this Zeus, is explained by the Semitico-Egyptian name of the region where his temple was built. This is Hazi, or Hazion, that is, 'the land of the asylum,' a name which perfectly suits the position of a sanctuary situate at the most advanced point of the Egyptian frontiers towards the east."

"It was on this narrow tongue of land, bounded on the one side by the Mediterranean Sea, on the other by the lagoons of weeds, between the entrance to the Khiroth, or the Gulfs, on the west, and the sanctuary of Baal-zephon on the east, that the great catastrophe took place. . . .

". . . After the Hebrews, marching on foot, had cleared the flats which extend between the Mediterranean Sea and the lake Sirbonis, a great wave took by surprise the Egyptian cavalry and the captains of the war-chariots, who pursued the Hebrews. Hampered in their movements by their frightened horses and their disordered chariots, these captains and cavaliers suffered what, in the course of history, has occasionally befallen not only simple travelers, but whole armies. True, the miracle then ceases to be a miracle; but, let us avow it with full sincerity, the providence of God still maintains its place and authority."

"Dr. Brugsch has here made a perfectly gratuitous concession, and fallen into the common error of confounding a miracle with a special providence. The essence of the miracle consists in the attestation of the Divine presence with his messenger by the time and circumstances of an act which may, nevertheless, be in itself an application of what we call the laws of nature to a particular case. It shows the Creator, whose word established the laws of nature ('He spake, and it was done. He commanded, and it stood fast'), repeating the word through his prophet or minister, by which those laws are applied to a special purpose and occasion. Thus, here the wind and sea-waves are the natural instruments: their use, at the will of God and the signal given by Moses, constitutes the miracle, without which all becomes unmeaning.—ED." [U.]

"The important fact is, that the destruction of the Egyptian host is shown to have been brought about by the operation of natural forces. This being established, it does not matter whether theologians call it a miracle or an instance of divine interposition."—U.

"When, in the first century of our era, the geographer Strabo, a thoughtful man and a good observer, was traveling in Egypt, he made the following entry in his journal:

"'At the time when I was staying at Alexandria the sea rose so high about Pelusium and Mount Casius that it inundated the land, and made the mountain an island, so that the road which leads past it to Phœnicia became practicable for vessels'" (Strabo, i. p. 58).

"Another event of the same kind is related by an ancient historian. Diodorus, speaking of a campaign of the Persian king Artaxerxes against Egypt, mentions a catastrophe which befell the army in the same place (Diodorus, xvi. 46):

"'When the king of Persia,' he says, 'had gathered all his forces he led them against Egypt. But coming upon the great lake, about which are the places called the Gulfs, he lost a part of his army, because he was unaware of the nature of that region.'"

Or this Sirbonian bog and more southerly morasses may have become

passable in consequence of an unusually dry season, and Pharaoh ventured upon it as affording a short cut to intercept the flying Israelites, whereupon the surface soil having given way under hurrying multitudes, the greater part of his army was swallowed up in its treacherous depths of mud and quicksands,—perils which often lie hidden beneath a flourishing growth of semi-tropical verdure. The writer has had a nearly fatal experience of the folly of making short-cuts over doubtful or boggy ground, once having been nearly submerged, and extricated only by providential succor in extremity.

The destruction of Sennacherib's army, B.C. 710 (Isaiah xxxvii. 36) is attributed in Holy Writ to its direct extinction by angelic visitation. It is now acknowledged, however, that the idea which is generally held in regard to angels as instruments of God's will comprehends applications of divine power which have nothing to do with what is ordinarily accepted as the *personal* action of supernatural beings wearing human appearances. Egyptian tradition ascribes the utter overthrow of the Assyrian conqueror to the fact that multitudes of field-mice gnawed the bowstrings of the archers which composed the bulk of Eastern armies, and, thus disarmed, the Assyrians became the prey of the enemy. This visitation of mice, which in itself would be miraculous, is explained by the discovery that a mouse was the hieroglyph for devastation and destruction; and the inhabitants of Troas worshiped mice as the agents which, in some localities, destroyed with their teeth the efficiency of warlike instruments which depended on strings,—like the bow and the sling. A mouse was also the symbol of Mars.

This, again, accords with the explanation by other commentators, that the Assyrian army perished by a sudden outbreak of such a disease as the cholera consequent upon local malaria, as well as co-operating exceptional atmospheric phenomena.

The learned biblical critic, Lange, in his commentaries on the "Second Book of Kings" (p. 219), expressly attributes the mortality to pestilence. This is by no means inconsistent with what is to be found in detailed military histories of much more recent events. It is wonderful how many armies have wasted away through epidemics in modern times, although not smitten out of existence, as it were, by supernatural causes. Men do not now see the destroying angel as David beheld him, sheathing his sword when the pestilence was stayed, any more than a general holding a desperate position and in extremity has vouchsafed to his desponding subordinates the revelation of the encompassing armies camped between the beleaguered walls and the lines of the investing enemy, which was manifested to the vision of the servant of the prophet Elijah.

A number of modern as well as ancient armies have melted away through disease consequent upon hardships, exposure, and improper food, although not so suddenly as in the case of Sennacherib and in

several modern instances, in spite of all the improvements, appliances, and precautions of modern military hygiene. Any one who is at all acquainted with what is styled English classic poetry must remember Glover's famous verses entitled "Hosier's Ghost," which commemorate the fatal result of the British expedition to the West Indies in 1727, when almost the entire crews of Hosier's fleet perished miserably of yellow fever and his ships were ruined by worms. Others, again, attribute the overwhelming destruction of the Assyrian forces to a severe occurrence of the simoom, by which means one army of Cambyses was entirely cut off between 529–522 B.C., in his expedition against the temple of Jupiter Ammon, to the westward of Egypt; and another, like that of Toussoun Pacha in recent times, in a great measure destroyed by hunger and disease in a subsequent campaign against the Ethiopians.

Few students of natural history but are familiar with the destruction of vast caravans by the hot, deadly winds which sweep over the deserts of Africa and Southern Asia. A Western "blizzard" would make short work of an invading column, and similar storms have swept into eternity more than one expedition which, in all "the pomp and circumstance of glorious war," undertook to cross in wintry seasons the icy steppes of Central Asia. Our own little army can understand this from what befell the detachment of United States cavalry and infantry, Christmas-time, 1874, among the Black Hills, the particulars of which are so admirably given by Major-General James B. Fry in his interesting work entitled "Army Sacrifices," article "Forty Degrees below Zero."

The military catastrophe of the vastest dimensions with which this century is acquainted was that which overtook Napoleon's expedition to Moscow. Very few, however, are aware that the pursuing army of Russians suffered from the same causes in almost as terrible—if not, proportionately to numbers, in as great—a degree. The French invaders, retreating seven hundred and ninety miles through devastated lands, with scarcely any of the requisite appliances, and almost destitute of food, lost four hundred and eighty thousand out of five hundred thousand combatants (Alison, iii. 594, 2), or four hundred and sixty-three thousand out of five hundred thousand (ibid., 597, 1), while the Russians, moving through parallel districts which had not suffered equally from the horrors of war, and more accustomed to the rigors of their own climate, had to deplore a loss of eighty-five per cent. on the same line (ibid., iii. lxvii. 597, 1). When, 12th December, 1812, at Kowno, "in the middle of the night," says Labaume (241), "the chief of the staff came to look for the Fourth Corps, known by the name of the Army of Italy, and which contained the Italian Royal Guards, comprising, when it crossed the Niemen, forty-two thousand men (Cust, ii. iii. 235), it (the Fourth Corps) was literally shut up in a single room." Scherr (ii. 382) says the Russians began the pursuit of Taroutina with one

hundred and two thousand two hundred and fifty-four men; at Wilna, only forty-two thousand were present with their colors.

Several retreats have been styled "Moscow disasters in miniature," among these the withdrawal of the French expedition from its failure before Constantine, in November–December, 1836. Perhaps comparing small things with great, as to the numbers who succumbed and distances traversed, the troops which followed Marshal Belleisle out of Prague, 16th–17th December, 1742, suffered almost as much as those which left Moscow with Napoleon. The emperor, while commanding, had about six hundred miles to traverse, and it might almost be said that the magnitude of the disaster was due to himself, his own incompetency; whereas Belleisle's enterprise was the result of a gallant resolve to avert a national disgrace, whose imminency was due to others and its avoidance to himself alone. With ten or eleven thousand foot and three or four thousand horse he made a march of ten or twelve days and of one hundred to one hundred and twenty miles, amid intense cold, through great depths of snow, by unfrequented roads through the mountains and over marshes never before trodden by the foot of man, and only passable because frozen solid. He himself, disabled by the gout, was carried along in a litter, or in a light sledge always harnessed; but such were his able dispositions that, although surrounded by enemies, regular and irregular, the only impressions made upon his gallant troops were by the severities of the season and the region. General Cust, in his "Annals," says that he lost eight hundred men in the snow, and left hundreds through weariness and hunger to the mercy of their pursuers between Prague and Egra, where he found refuge on the 26th of December. Schlosser (iii. 396) states that his whole way was strewed with dead, and the weary, hungry, and wounded; that the majority of those who were saved carried within them the seeds of dissolution, and that it is very uncertain how many of the French did survive to reach Egra. Carlyle, who possesses an absolute power of exhausting information in the collection and digestion of facts, relates that Belleisle left thirteen hundred frozen in the wildernesses, but that half of those that remained fell ill at Egra of diseases resulting from the labors and exposures which proved fatal then or soon after, so that by the time they got back across the Rhine, 5th February, 1743, not quite one-eighth of the number were left,—about five-eighths were dead and two-eighths were missing. Thus perished the French army of Bohemia.

What were the sufferings of Valley Forge to those of the French retreat or Russian pursuit from Moscow? Of the former, at least five hundred thousand advanced to the Russian capital. Alison informs us that when the retreat ended only thirty-seven thousand were alive. The Fourth Corps marched forty-two thousand strong. Labaume tells us that when the chief of staff came to look for it at Kowno "it was literally

shut up in a single room." Kutusoff set out to pursue Napoleon with about one hundred and twenty thousand, which were reinforced by two armies. It may not be an exaggeration to say that the aggregate was two hundred thousand; of these, only thirty thousand were able to bear arms when the headquarters was at Kalisch, in Poland.

The catastrophe of the retreat from Moscow has become the synonym for the most horrible sufferings which an army can experience. Its magnitude is so shocking that it well-nigh exercises a benumbing influence on thought. If the details were critically examined the human mind would be almost sickened with the manifold and excruciating forms in which the unhappy soldiers paid "the last full measure of devotion" to secure the personal safety of a conscienceless, utterly selfish, heartless despot.

The following from the not generally known "Itinerary of Napoleon I. from Smorgoni to Paris, 6th–18th December, 1812, contributed from the note-book of an eye-witness, the Polish count, Dunin Wonsowicz, who accompanied the emperor as interpreter, is of sufficient interest for insertion.

Arriving at Oszmiana in the middle of the night (5th–6th December), after leaving Smorgoni the previous evening, the emperor was astonished to find the garrison under arms in expectation of an attack from the Cossacks. Among these troops were two detachments,—together two hundred and sixty-six horsemen,—the one from the "Chevaux-legers" (Polish Lancers of the Guard), one hundred strong, the other from the Seventh Regiment of Polish Lancers of the Vistula. Contrary to the advice of the Würtemberg general commanding, Napoleon determined to hazard a safe passage, and continue his route, remarking that he "always counted on his fortune, or good luck, without which no one ever succeeded in anything." Accordingly, he set out at two o'clock in the morning, 6th December, descrying through the frost-fog which hung over the snow the bivouac-fires of the Russians, through which they passed in safety. The cold was so intense that the enemy were glad to keep near their watch-fires, but this low temperature was fatal to all but thirty-six of his successive escorts; that is to say, the lives of all but this handful of survivors were expended that night to save a tyrant in whom the Poles hoped to find a liberator, but who in reality was a greater oppressor than either Russians, Prussians, or Austrians, whom they regarded as the destroyers of their country. When either horse or man fell he had to be abandoned, and that was the end. The Duke of Rocca Romana, who commanded the Neapolitan Horse-Guards that replaced the Poles next morning, had his hands frozen. The mercury had fallen to 28° below the zero or freezing point of Réaumur, which is about 30° below zero Fahrenheit. Remember, the troops who suffered thus during this night of flight were not the extenuated soldiers of the Russian campaign, but men who had experienced none of the

vicissitudes of active operations, and, comparatively well fed and supplied, left their quarters in garrison to discharge escort duty of only a few hours.

The sufferings of the Continental troops during the American Revolution, especially at Valley Forge, have always been held up to our people as the acme of human endurance, and as the best proof of the superlative patriotism which could induce soldiers to submit to such hardships to insure the freedom of their country. This, like many of the myths of the Revolution, is what Carlyle styles "superlative (or sublime) bosh." The repressive discipline of the American army was about as terribly severe as it could possibly have been. Some of the stories told of it are shocking, and would be worthy in themselves of a detailed article involving a copious and careful array of authorities, which would make it a task of no little magnitude. When the Pennsylvania and New Jersey Line mutinied, their incitements to revolt were nothing to those which were cheerfully borne by armies—particularly the French revolutionary armies—within the next twenty years. An illustrative engraving, published at the time, depicts a French general under the Republic reading a congratulatory order of the Convention to his command. All are represented standing at attention, and over their knees in water. Tattered and battered, they look like a legion of scarecrows. The order reads thus: "The Representatives of the People return the thanks of the Nation to its gallant army for its late glorious victory, and as a testimony of its satisfaction accord to each soldier a pair of wooden shoes." There was literally more truth than poetry in this satire.

Our armies on the plains and operating against the Indians farther to the north are called upon to encounter, every winter, greater vicissitudes than could have entered into the imagination of the Continental troops, and hunt the savages at a temperature which is utterly unknown in any portion of the Atlantic slope of the United States, except, rarely, along its northeastern border. They are often out during the prevalence of "blizzards," a phenomenon with which our people were unacquainted until the progress of settlement brought them within the sphere of their visitations.

Hannibal lost over thirty thousand veterans in crossing the Alps. During the "Thirty Years' War" the miseries experienced by the opposing armies were beyond description. The flight of the court adherents and troops of the "Snow-King"—the Elector Palatine (best known through his wife, Elizabeth, Princess of England, the "Pearl of Pearls," and her lover, Duke Christian of Brunswick, him of the "Iron Arm") from Prague, after the battle of the White Mountain, 8th November, 1620, the *initial* conflict of the Thirty Years' War; and the disastrous retreat of Ibrahim Pasha from Syria in 1840, according to M. Achille Laurent, are said to have borne in many particulars, in

petto, a strong resemblance to the French retreat from Moscow. The celebrated engraver Callot has left a series of pictures of the military horrors of the succeeding period which transcend words. What famine began fever finished. Armies disappeared. During the winter campaign of Frederic the Great and Field-Marshal Daun, 1759–60, the men "died like flies"—died as any one who has lived in the country has seen wasps and flies and other insects die, smitten to death in myriads by a sudden and severe frost. Archenholz speaks of a hundred and two used up by frost during a single winter march of a few hours, in 1761. Arnold's passage of the water-shed between the Atlantic and the St. Lawrence, in 1775, was an exhibit of what resolute men can stand and overcome: and between the commands of Montgomery and of Thomas, through cold, destitution, and smallpox, the American armies in Canada in the winter and spring of 1775–76, almost wasted away. In December, 1794, and January, 1795, the British forces under the Duke of York, in the Netherlands, suffered, through the cold and wet, to such a degree, that what they experienced has likewise been compared to the horrors of the Moscow retreat. It is stated that the severity of the frost was greater than had been known for a hundred years; and yet the winter of 1708–9 had been deemed without a parallel. French writers can scarcely find words to express the demands upon the fortitude of the armies which were opposed to Marlborough. The writer has before him a copy of a letter by a relative written at Rotterdam, Holland, 21st May, 1709, which states: "The last winter was so extraordinarily cold that not only were the rivers frozen, but also, for many miles out from the shore, the sea was covered with fields of driving ice, and mountains of it were thrown [piled?] upon the coast."

Peyrat tells us that, in the same winter, "rich men held out their hands for alms, and were compelled to solicit, as an extreme favor, admission into hospitals; but the hospitals, gorged with the poor, driven into them by the universal misery, vomited forth again the miserable wretches who sought their asylums." Crowe adds, "the strongest elixirs froze in the warmest rooms of the palace" of Louis XIV.; and Pardoe, that "the French army were daily perishing from hunger." Michelet corroborates Moret as to the condition of the French people, and the worse destitution of the troops. Nevertheless these troops came up to their work splendidly in the next battle, Malplaquet, and there is no mention of mutinies.

Even this catastrophe, terrible as it proved, was surpassed by the fate which befell the right or northern wing or column of the forces with which Charles XII. of Sweden invaded Norway the second time, in October, 1718. About the 1st of December Charles invested Frederickshall, in latitude, north, 59° 20′, and was killed or assassinated before this place on the 11th of the same month. Frederickshall is a fortified seaport on the arm of the Christiania Fiord, the northeastern

insertion of the Skager-Rak, about one hundred miles directly north of Skagen, the northern extremity of Jutland or Continental Denmark. The season was so severe that the ground was frozen as solid as a rock, and the sentinels were frequently found frozen to death on post.

Meanwhile, General Armfelt was sent to besiege Drontheim (Trondhjem), situate on a fiord of the same name putting in from the North Sea, over three hundred miles still farther to the north, in latitude 63½°.

Baron Karl Gustav Armfelt (born 1666, died 1736) was an officer of distinguished military merit, and greatly experienced in campaigning in cold regions. He began his military career in the French service, but the renown which won the confidence of his monarch had been acquired in northern campaigns, especially against the Russians. Consequently, he must have known what he had to encounter when he undertook this expedition.

While Armfelt was before Drontheim, Charles, as previously stated, lost his life before Frederickshall.

Schlosser (iii. 11, § iii., 160) favors the opinion that Charles XII. was assassinated, and in spite of all the arguments and testimony to the contrary, the event was so opportune that, taken in connection with what follows, it is scarcely possible to believe that his death was simply one of the ordinary accidents of war.

"The opinion that Charles XII. fell a sacrifice to a conspiracy, and that his sister, Ulrica Eleonora, who was married to the crown prince of Hesse-Cassel, was not altogether unacquainted with the scheme of the conspirators, appears to be confirmed by the Swedish revolution which immediately followed, and by the manner in which the news of the king's death was conveyed to Stockholm. Adjutant Siggert, who afterwards (1722), in a fit of madness, accused himself of having been guilty of the king's murder, first carried the intelligence to the crown prince of Hesse, who was at a nobleman's house about three-quarters of an hour from the trenches, and the prince sent him secretly forward to his wife, who was in Stockholm, and, singularly enough, sent her at the same time the hat which the king wore, and which was pierced by a ball.

"The council of government hastened to acknowledge the rights of the new queen as soon as she had given her promise to consent to a complete alteration of the existing constitution. An assembly of the states was summoned on the 11th of February, 1719, for arguing upon and drawing up a new constitution. Whilst the elections for members of the assembly were being held through the whole country the Swedish army, which had been before Drontheim, was utterly lost in a most melancholy manner.

"Armfelt resolved to march back to Sweden, and to cross the northern mountains, in the midst of an extremely severe winter (January, 1719); and in consequence of his attempt, his whole army, with

the exception of five hundred men, perished from cold, and he himself, with the greatest difficulty and maimed by the frost, again reached the inhabited parts of Sweden."

Such is the great German historian's summing up; but other accounts aggravate the catastrophe. According to some of these, six hundred perished in a single night; and with the exception of Armfelt and a few officers, themselves more or less fatally frost-bitten, the whole six thousand perished.

In order to account in some measure for this almost unprecedented military calamity, it is well to state that at Roerass, a mining town, sixty-seven miles southeast of Drontheim, on table-land six thousand to seven thousand feet above the sea, almost perpetual winter reigns, and in 1830 the thermometer ranged 38° below the zero of Réaumur (9° Fahrenheit = 4° Réaumur), about 58° below zero Fahrenheit, which is the cold of the polar regions. The road by which Armfelt had to retreat first skirts the Drontheim Fiord to Vaerdalsoren, about fifty miles to the northeast; next turns to the east-southeast, crossing the Tydal Dofriens, or Dofrines, or Doverfield range, the backbone between Norway and Sweden; then traverses the district of Iaemtland or Oestersund, and ends at Sundsvall, on the Gulf of Bothnia, two hundred and twenty miles north of Stockholm. This route runs at the foot of Mount Areskutan, which rises to the height of four thousand seven hundred and twenty-one or five thousand one hundred and sixty-three feet, which is about one hundred and seventy-three feet higher than the Catskills, but subject to far greater cold, because twenty-three degrees more to the northward. The climate of this region is very stormy, and, comparatively speaking, rigorously cold even in summer.

The mountain districts in which all this occurred are an absolute wilderness. They are not only destitute of any growth which can afford the slightest sustenance to man or beast, but of any material which could in the least degree contribute to warmth or comfort. History is undecided whether this doomed column owed its destruction originally to treacherous or incompetent guides. But however greater or less the influence of such human instrumentality, no one could have foreseen the extent of a disaster which could alone have been accomplished by natural agencies. As stated, this region is subject to fearful storms even in the mildest season. A tempest which can only be compared to a northwestern "blizzard" burst with blinding fury upon these hardy Swedes and Finns. How long they struggled against it can never be known. The snow became their winding-sheet, and gradually buried them deeper and deeper, as Pompeii disappeared beneath the rapidly accumulating showers of the opposite extreme,—ashes and boiling water, instead of snow and silting hail.

When the spring came and the snow began to melt, the horses were found frozen stiff, harnessed to the cannon, the artillery- and baggage-

wagons. With the increasing heat of the sun, the effluvia from the corpses of men and beasts was so powerful and widely spread that it allured myriads of beasts and birds of prey. These flocked thither in such multitudes to feast upon the victims of ambition that for many years afterwards hunters resorted to the fatal spot for the peltry, which they secured in abundance from these carnivora.

J. Watts De Peyster,
Brevet Major-General S.N.Y.

NAVAL FOOD AND CLOTHING.

THE field of professional and practical discussion leading towards progress in military and naval science has been greatly enriched of late years by valuable contributions to our service literature. There can be no doubt as to the benefit derived from the unity of effort induced by such contributions and the consequent improvements.

Naval architecture, ordnance, hygiene, and engineering have each been subjects of careful thought and suggestion, have been respectively experimented upon and advanced.

The writer has for a long time noticed the absence from these professional discussions of any interest in the matters of food and clothing for our men-of-war's-men. It cannot be denied that upon the character of these articles must depend in great measure the endurance, discipline, and contentment of our crews; and if this effort to bring their importance forward can be the first move towards arousing an interest and enthusiasm among the younger officers,—prompting them to study and suggest healthful additions to the food and comfort of our men,—the paper will gladly be considered but a preface to better work.

While the regulating by Congress of the kind and quantity of the sailor's food leaves little discretionary power to the Navy Department for experiment and change, we can, by proper study, make the most of what is given us, and the knowledge of its values can be more generally diffused. It will be seen, therefore, that this article cannot be intended to criticise the administration of those controlling the supply and issue of our naval food and clothing. On the contrary, it is a fact that improvements, especially in the latter branch, have been noiselessly but carefully introduced.

Looking first into the subject of food, we find that there are three important points to be considered in aiming to secure the highest excellence for our navy ration. They are,—

First. To obtain that food which contains the greatest nutritive qualities.

Second. To prepare and furnish such food in the most condensed form consistent with a retention of its nutriment; and,

Third. To adopt the most efficient means for its preservation.

There are other minor considerations, such as cooking, and the

supply of accessory food or vegetables, that it is needless to discuss at present.

A diet, in order to afford perfect nutrition, should, according to many eminent physiologists,[1] be based upon a proper combination of four great classes of elements, viz.:

1. Nitrogenous substances (including albumen, fibrin, gluten, etc.).
2. Fatty substances (including all animal and vegetable oils).
3. Carbo-hydrates (starch, sugar, etc.).
4. Salts (potash, soda, lime, etc.).

Before consulting our present ration table, however, it may be interesting to note briefly its growth from the first establishment over a century ago.

The navy ration was first arranged definitely in accordance with an act of the Continental Congress dated November 28, 1775, and was as follows:

Sunday.—1 lb. bread, 1 lb. beef, 1 lb. potatoes or turnips.

Monday.—1 lb. bread, 1 lb. pork, ½ pt. peas, and 4 oz. cheese.

Tuesday.—1 lb. bread, 1 lb. beef, 1 lb. potatoes or turnips, and pudding.

Wednesday.—1 lb. bread, 2 oz. butter, 4 oz. cheese, and ½ pt. rice.

Thursday.—1 lb. bread, 1 lb. pork, and ½ pt. peas.

Friday.—1 lb. bread, 1 lb. beef, 1 lb. potatoes or turnips, and pudding.

Saturday.—1 lb. bread, 1 lb. pork, ½ pt. peas, and 4 oz. cheese.

Half a pint of rum per man every day, and discretionary allowance on extra duty and in time of engagement, and a pint and a half of vinegar for six men per week.

March 27, 1794, an act was passed modifying the above table by introducing salt fish on Friday, by reducing vegetables to one day per week, and allowing one quart of beer in lieu of distilled spirits when desired. The next change, by an act dated March 3, 1801, reduced the allowance of bread to fourteen ounces, furnished flour in lieu thereof, and added suet and molasses to the ration. The salt fish was abolished.

Thus it remained until August 29, 1842, when a daily allowance was arranged, but allowing the Department to distribute the articles through the days of the week as might seem best.

Dried fruit and pickles were introduced as accessory foods, and coffee, tea, and cocoa were supplied.

The abolition of spirits, and the increase of coffee, tea, and sugar in

[1] See Parkes's Hygiene: London, 1865. Dr. Lyon Playfair's lecture on the Food of Man in Relation to his Useful Work: Edinburgh, 1865. Dr. Geo. Wilson's Hygiene and Sanitary Science: Philadelphia, 1873. There are other authorities, notably Moleschott, Liebig, and Hammond, to whose works the writer has not had access, but who are quoted as being in accord concerning the data herein given.

lieu thereof, occurred during the war of the Rebellion, and the table now stands as follows:

Sunday.—14 oz. bread, ¼ lb. preserved meat, ½ lb. rice, 2 oz. butter.

Monday.—14 oz. bread, 1 lb. pork, ½ pt. beans.

Tuesday.—14 oz. bread, 1 lb. beef, ½ lb. flour, and 2 oz. dried fruit.

Wednesday.—14 oz. bread, 1 lb. pork, 4 oz. pickles, ½ pt. beans.

Thursday.—14 oz. bread, ¼ lb. preserved meat, 2 oz. butter, 6 oz. tomatoes, ½ pt. molasses.

Friday.—14 oz. bread, 1 lb. beef, ½ lb. flour, 2 oz. dried fruit.

Saturday.—14 oz. bread, 1 lb. pork, 4 oz. pickles, ½ pt. beans, ½ pt. vinegar.

4 oz. of sugar, ½ oz. of tea or 2 oz. of coffee, daily.

Moleschott, the greatest authority upon the subject of diet, according to Drs. Parkes and Wilson, says that the water and food required daily for a working man of average height and weight are:

	Oz. Avoir.
Albuminate substances	4.587
Fatty substances	2.964
Carbo-hydrates	14.257
Salts (all kinds)	1.058
	22.866
Water	98.580
	121.446

The nutritive values as represented in the rations furnished the navies of England and France are stated by Dr. Playfair to be as follows:

	Flesh-former. Oz.	Fats. Oz.	Starch and Sugar. Oz.
English sailor	5.00	2.57	14.39
French sailor	5.74	1.32	28.60

and we are enabled by reference to the tabulated statements of the authorities before mentioned to ascertain with tolerable accuracy the value of our own.

The *average* daily issue is thus found to be:

Flesh-former.	Fats.	Starch and Sugar.
6.06	3.18	19.39

and seems a favorable exhibit as compared with other rations.

In detail, however, there appears a lack in the proportion of fatty substances upon three days of the week (Monday, Wednesday, and Saturday), and it might be well to consider whether an advantage would result by a more equal distribution of those aliments, either by a transfer from those days showing an excess, or by the introduction of some other fatty substance, such as cheese. This article seems to be in general favor, and exists in nearly all European ration tables. About half a pound

of it contains as much nitrogenous substance as one pound of meat, and one-third of a pound is equal to a pound of meat in fatty substances.

The accessories of the diet, such as tomatoes, vinegar, and molasses, are well distributed. Desiccated potato was tried for several years, but did not meet with favor, and has been abolished. A much better article is, however, prepared in England, and supplied to the English sailor.

The preparation of concentrated food, the second consideration of importance, has received much attention recently, and with variable results.

It has often been said that the Prussians vanquished the French in the late war between those two countries by a sausage, and surely the Erbsenwurst contributed greatly towards their success. It is a sausage composed of a judicious mixture of meat, peas, and spices, is very nutritious, palatable, and easily carried, as well as readily cooked.

For purposes of boat expeditions and rapid movements away from our vessels, we should certainly supply some more concentrated food than kegs of salt beef and pork, or bulky bags of bread, which, besides occupying valuable space in the boats, require so much labor in cooking. Among the many varieties of meat biscuits and prepared food no doubt will be found suitable articles.

Indeed, the great loss of nutritive qualities incurred by the present old-fashioned mode of packing salted meats in brine would seem to urge experiments and trials with other methods of preparation. Liebig, whose experiments have been quite exhaustive upon this subject, estimates that the nutritive loss by packing in brine is from one-third to one-half, and states that the brine is full of the juice of meat. Another writer says that extract of meat can be obtained from brine by dialysis. A small expenditure, if Congress would so authorize, for purposes of experiment in this and kindred matters would no doubt be well administered by the Bureau of Provisions and Clothing, and result in advantage to the sailor's food.

The best modes of preventing deterioration in our stores, after their receipt and inspection by the proper officers, are no doubt already known. Therefore it would be presumption upon the part of the writer to consider them here. He begs, however, to briefly call attention to the subject of clothing, as an important feature in considering the efficiency of our service.

The materials used in their manufacture have been well selected, wool forming the principal feature. This is very well for outside clothing, but it seems to the writer that the introduction of a small percentage of cotton in the material for *under*clothing would be an advantage, inasmuch as shrinking and fulling would be prevented. By frequent washing pure wool flannel becomes so close that its chief advantage, its absorbent quality, is greatly lessened. Even the matter of color might well be sacrificed to this consideration.

It is noticeable that but one style of head-dress is supplied for all sorts of weather and climate. It is a heavy, lined, cloth cap, and could perhaps be discarded in tropical regions for one of lighter material, or, what would be more economical for the sailor, the top might be made adjustable, to be replaced by linen. The lining could also be made of light water-proof linen, and so arranged as to fall about the neck and protect it during rain. It will of course violate all the traditions and apparent picturesqueness of the sailor's garb to depart from the well-known style of trousers, and a suggestion to do so may perhaps not be cordially received. But for freedom of action, as well as for considerations of health and comfort, it hardly seems, to the writer, to be the best that can be devised.

Close, and even tightly fitting over the hips, and with several inches of spare width flowing about the feet, they are the exact reverse of the shape recommended by the most eminent army surgeons who have written upon the matter.

Dr. Parkes says, "The much laughed at peg-top trousers seem to be, in fact, the proper shape." Without, however, so radical a departure as the "peg-top," the hips might be relieved a little, and the support be obtained by a waistband or belt. As now constructed, a considerable part of the force required to move the hips in walking or climbing is exerted in overcoming the restraint of the trousers.

Many of your readers will have noticed the lack of storm clothing on our men-of-war, and the subject no doubt has been frequently discussed. It is merely mentioned here in order to express the writer's hope that some protection of that nature will ere long be devised.

Finally, the writer would renew his appeal to naval officers generally to study more closely the important field over which this paper has so hastily traveled. The sailor's food and clothing will be found to be as important features as are our guns and machinery.

GEORGE H. READ,
Passed Assistant Paymaster U.S.N.

ARMY ITEMS FROM EUROPE.

THE following translations of military news have been made in hopes that they may prove of interest to the numerous readers of THE UNITED SERVICE. They originally appeared in the official journal of the French War Department. It is thought that something may be learned from such articles. A general and uniform system of signals for the protection of markers at the butts is certainly needed in our army as well as in that of Holland. From the regulations promulgated with a view of making Italian soldiers good marksmen, one stands forth as worthy of adoption by our general government. Certainly the regular army, and through it the country, has been sufficiently benefited by the continued and zealous exertions of the militia at Creedmoor and elsewhere to render some small return especially fitting. It is to be hoped that the ordnance department will initiate legislation looking to the furnishing of all organized militia companies with ammunition *at cost price* for such practice.

HOLLAND.

Adoption of an Apparatus intended to increase the Security of Markers during Target-firing.

A ministerial decree of September 10 directed the use of special signals, intended to increase the security of markers during target practice by infantry and cavalry. We reproduce from the *Recueil Militaire* its description, as well as the directions relative to its use:

"1st. In future there will be used for each target range two red circular signals, one to be placed in the marker's shelter, the other near the marksman.

"2d. The display of the signal above the shelter indicates *it is forbidden to fire* or *stop firing*, and its display near the marksman, *firing* or *going to fire*.

"3d. Each signal will be composed of a circle of wood or thin iron, from 0.70 to 0.77 metre in diameter, covered with some stuff of a bright red color; the circle must be strongly secured to a staff of such length that the lower edge of the circle can reach at lease 0.50 metre above the embankment of the shelter or the heads of the marksmen.

Signals from the Shelter.

"4th. Besides the corporal charged with pointing out the hits, and the soldier who covers over the holes in the target, there must be in the shelter a man to whom is intrusted the management of the signal. This third man should remain in the shelter even when the two others leave it in order to point out the hits.

"5th. When a hit is made, the above-mentioned man, by the corporal's order, raises vertically the signal while turning one of the red faces towards the marksman, until the lower edge of the circle is about 0.50 metre above the upper edge of the shelter. The signal is kept in that position during the whole time that either of the markers is outside the shelter.

"6th. The markers are authorized to leave the shelter only some instants after the signal has been arranged in the manner indicated above. When the corporal doubts that the ball comes from the range to which he is assigned, before emerging from the shelter they wait a certain time after the appearance of the signal before referred to.

"7th. It is forbidden to load a piece or to fire during the display of the signal above the shelter. When the signal is given after a marksman has commenced to load, or while he is preparing to fire or aim, the officer in charge of the firing should immediately stop the loading or aiming, and cause the cartridge to be removed.

"8th. The corporal alone is authorized to lower the signal, and only after the complete re-entry of the markers into the shelter.

Signals near the Marksman.

"9th. The officer charged with superintending the practice station near the firing-place, a corporal or soldier, is provided with a red signal, so that when he raises the signal he can be seen by whoever emerges from the shelter. The above-mentioned officer can alone order the raising or lowering of the signal.

"10th. The signal should be raised each time that a marksman commences loading. It must be kept up vertically some instants after the shot, one of its faces turned towards the shelter, and the lower edge about 0.50 metre above the men's heads. During such time as is occupied either in loading or firing the signal should be lying on the ground, or placed in such a way as to be invisible to the *personnel* of the shelter.

"11th. The signal near the marksman must not be raised as long as that of the shelter has not been withdrawn.

"12th. It is formally forbidden to load a piece or to prepare to load while the marksman's signal is lowered.

"13th. The corporal-marker should each time before quitting entirely the shelter assure himself that the marksman's signal is down; in no case and under no pretext should he neglect, at the moment when he emerges from the mouth of the shelter, to look towards the marksman. When he notices that the marksman's signal is up he re-enters precipitately the shelter.

"14th. The use of *spying-mirrors* arranged in such a way as to reflect into the shelter the entire range is recommended, in order to render the signals near the marksman visible to the marker while in the shelter."

ITALY.

The question of repeating arms is now being studied in the Italian as in most other armies. Comparative tests have been made on a small scale with different models of repeating arms, and for more extended tests in the army at large the gun presented by Captain Bertoldo (of the engineers) has been selected, according to *l'Esercito* of October 28, 1880, from which the following details are copied:

"Submitted to several committees and having been favorably reported on, the Bertoldo gun has been issued to different troops, as follows: to a regiment of the First Corps at Turin, to a regiment of *bersagliers* of the Fourth Corps at Plaisance, and to the Tenth Alpine Battalion,—fifty to each command. The Bertoldo gun can be used at pleasure either as a repeating arm or with a single cartridge. It has the same barrel and fires the same cartridge as the Vetterli gun. Moreover, the gun now in use, whose excellent shooting qualities are universally acknowledged, and which succeeded so admirably at the recent contest (*concours de tir*) at Vienna, can be converted into a repeating arm under this system. This conversion is simple, and the cost while not exceeding will probably be less than ten francs per gun. The manufacture of the new gun will be no more costly than that of the present arm. The simplicity of the mechanism is such that it will not be necessary to purchase special machinery either for present conversion or future manufacture of these arms. By using the repeating attachment, nine shots can be fired from the Bertoldo gun in eleven seconds; as a simple arm it fires twenty shots per minute. These results were attained by a commission which met at the camp of St. Maurice."

The Ministers of War and Interior are to present at the re-opening of Parliament, owing to the recommendation of several deputies, the draft of a law for the promotion of societies and shooting contests throughout Italy. *L'Esercito Italiano* of November 3 gives the following details relative to the economy of this project, the importance of which is unquestioned:

"The end proposed is to develop as far as possible military *esprit*, to inculcate youth with a taste for arms, and to perfect in these exercises the members of the second and third classes while keeping in practice those of the first class.

"Associations for target practice will be established on a wide scale; it will be considered not as a pastime or amusement, but as the military school of the nation. Every citizen will be summoned to contest in these exercises; they will be divided into three classes,—1st, school pupils; 2d, persons belonging to the army; 3d, civilians. These last will be divided into two classes, those over forty years old and those under twenty,—or, in other words, those who have already and those who have not yet served in the army. No one will be permitted to volunteer for one year or granted any favor pertaining to the military service who has not practiced in target-shooting at least two years. On the other hand, successful practice will insure such privileges. Target-shooting will be inaugurated in all the principal towns of the arondissement or canton. They will be considered as under the especial patronage of the Minister of War. A commission, consisting of the mayor and the commanding officer of the district, will supervise the direction and administration of these exercises. It will issue at cost to these societies such arms and ammunition as is allowed them. In the chief town of the province there will be a higher commission for this practice, comprising representatives of the civil and military authorities. Rifle associations (*sociétiés de tir*) will be formed in the capital of each canton as soon as a sufficient number of marksmen shall meet. This association will be presided over by a council, which will be composed in part of an officer of the army or militia, especially charged with the supervision of practical target practice. In colleges target-practice will be added to gymnastics and the manual of arms; it will be obligatory in lyceums. The pupils of the last-named schools will be conducted to the range as a military command.

"Every year there will be district rifle matches, and every three years a national contest.

"In all exercises those participating will always be classified under three heads,—schools, army, civilians.

"Each association will meet its own expenses by the smallest possible assessment on the marksmen, from contributions from individuals and *communes*, and by government aid.

"Private individuals can establish ranges for firing without being subjected to any governmental restrictions."

A. W. GREELY,
First Lieutenant Cavalry; Acting Signal-Officer.

EDITORIAL NOTES.

SLOWLY but surely the Græco-Turkish question approaches the stage of actual war. Both governments are straining every nerve to get ready for the conflict which, despite the efforts of the Powers to forestall it, the principals themselves seem to have accepted as inevitable. Greece has now about forty-eight thousand men under arms, and it is expected that she will be able to muster some eighty thousand with which to cross the frontier. The ultimate consequences of the actual opening of hostilities no man can with certainty predict, but we shall be greatly mistaken if it does not prove to be the most serious blow that Turkish dominion in Europe has ever felt.

GENERAL SKOBELEFF, commanding the Russian forces in Turkestan, had an engagement with the Tekke Turcomans near Geok-Tepe on the 24th of December, and the first report received represented that he had been compelled to fall back. This report is now officially denied.

THE latest advices from the belligerent republics of South America indicate that an attack on Lima was imminent. The Chilian forces are represented as numbering about forty thousand men, while the Peruvian capital musters for its defense between fifty and sixty thousand men, encamped at Chorillos, nine miles south of Lima by rail. Some skirmishes have taken place, but no serious attempts have been made to stay the advance of the invaders, the Dictator Pierola appearing disposed to await their approach behind the fortifications he has erected for the defense of the capital. The Chilian squadron in front of Callao has suffered a serious mishap in the explosion of the celebrated Armstrong gun on board the "Angamos," the breech of which blew out and went overboard, carrying with it several men. A similar accident also befell one of the 250-pounder turret guns of the "Huascar."

WHILE by no means disposed to add in the slightest degree to the fears naturally felt by those most nearly interested in the safety of the "Jeannette," we would come short of what we conceive to be our

duty in the premises did we fail to second most earnestly the suggestion now being mooted of organizing an expedition for her relief. In the *New York Herald* of January 12, Lieutenant Schwatka forcibly presents the vital point in the whole question, which is, that what is to be done should be done at once. This point he illustrates by reference to the case of Sir John Franklin, whose fate was largely due to the doubting and dilatory course of the lords of the Admiralty in organizing an expedition for his succor. And Franklin's case is but one of a series showing the perils of delay when once reasonable fears begin to be felt for the safety of Arctic voyagers. Unless, therefore, we are prepared to supplement the list of gallant explorers who have perished for want of timely succor with the names of De Long, Chipp, Danenhower, and their brave companions, let us at once set on foot an expedition for their relief.

THE *Pester Lloyd* of October 29, 1880, announces that the conversion of infantry arms being nearly finished, the Minister of War has ordered that the conversion of cavalry carbines to the model of 1877 be commenced. They will begin with the Eighth, Ninth, Tenth, and Eleventh Dragoons, the Sixth and Eighth Hussars, and the First, Third, and Seventh Uhlans. The improvement will be first applied to the arms of the six war squadrons of each regiment, and afterwards to the arms in reserve. The work will be done at the manufactory of artillery materials at Vienna.

AN excellent move is the recent order requiring the subsistence department at all military posts to keep for sale to troops clothes, hairbrushes, combs, towels, needles and thread, and at recruiting depots, in addition to these articles, tin plates and cups, knives and forks, buttonsticks, and brushes; and requiring that, as soon as the provisions of the foregoing paragraph can be carried into effect, the practice of entering stoppages of any description whatever against enlisted men, on the muster- and pay-rolls, in favor of post-traders, will be discontinued. It is to be hoped that the necessary legislation to give this order effect may be speedily had, and thus a beginning be made towards emancipating garrisons from their present enforced subservience to the post-trader establishments, which is harmful whether viewed from an economic or a moral stand-point. And when Congress comes to deal with measures looking to the welfare of army garrisons, it would be well if it would do something effective towards giving garrisons some social rallying-point other than the post-trader's store.

What is wanted, and what Congress should provide the means of

having at every army post, is a building devoted to, and especially designed for, social gatherings and rational amusement. It should contain a general assembly room suitable for religious services, lectures, social parties, concerts, and dramatic performances; billiard-rooms for both officers and enlisted men; and a library and reading-room. The appropriation for such a building should be sufficiently liberal to render it an entirely suitable and attractively appointed structure, and not a mere make-shift. When this idea shall have been realized at every important post there will be, we confidently predict, a noticeable improvement in the mental, moral, and physical tone of our frontier garrisons.

ACCORDING to the *Neue Freie Presse* of October 30, the Hungarian government has decided to establish at Fünfkirchen a permanent camp for the *landwehr*. Owing to the position of Fünfkirchen on the borders of Croatia, this camp is intended to accommodate not only the fourteen battalions of the fifth district, which includes nearly all of that part of Western Hungary which is on the right bank of the Danube, but seven Croatian battalions besides. The camp will contain two officer's *pavillons*, twenty-eight soldiers' barracks, and six barrack-stables; it can accommodate two hundred officers, nine thousand soldiers, and six hundred and thirty horses.

THE *Neue Freie Presse* of November 6 announces that, by the decree of October 21, 1880, the emperor has directed the establishment of a school of gymnastics and fencing at Wiener-Neustadt. This school, as far as its administration is concerned, will be attached to the Military Academy, but it will be under the direct control of the Minister of War. Its purpose is to form instructors in fencing and gymnastics for the military schools and bodies of troops. The course just commenced being only provisionary, will last but eight months. There are engaged therein a captain, a lieutenant, and ten non-commissioned officers. This special course is intended to educate instructors for the school itself.

How universally attractive military glory is to the human mind is well illustrated by the following scrap from Boswell's "Life of Johnson," which is one of the numerous bits of talk between the old lexicographer and his *fidus Achates* with which the book abounds:

Johnson: "Every man thinks meanly of himself for not having been a soldier, or not having been at sea." Boswell: "Lord Mansfield does not." Johnson: "Sir, if Lord Mansfield were in a company of general officers and admirals who have been in service he would shrink; he'd wish to creep under the table." Boswell: "No; he'd think he could *try* them all." Johnson: "Yes, if he could catch them; but they'd try him much sooner. No, sir; were Socrates and Charles the Twelfth of Sweden both present in any company, and Socrates to say, 'Follow me and hear a lecture in philosophy;' and Charles, laying his hand on his sword, to say, 'Follow me and dethrone the Czar;' a man would be ashamed to follow Socrates."

SERVICE LITERATURE.

"POEMS OF MANY YEARS AND MANY PLACES," by William Gibson, Commander U. S. Navy. Boston: Lee & Shepard. Commander Gibson pays graceful tribute to the Muses in the volume before us. He tells again in stately measure the old and stirring story of Persephone and gives new pathos to the Sibylline myth. "Alf and Alfhilda" is a spirited and smooth-flowing rendition of a fragment of Norse lore. In fact, the poet wanders through "many places," gathering the flowers of poesy with no unskilled hand, but as one "to the manner (of song) born." "Castellamare," the most pretentious—that is, the longest—poem of the collection, in its rhythm and strange medley of the sublime and the ridiculous, as well as in its gorgeous imagery and graphic descriptions, has a marked Byronic flavor not unsuitable to the subject. The poems of religious sentiment in this little volume are characterized by remarkable tenderness and depth of feeling. "Angeline" is of unsurpassed beauty and simplicity; "Holy Week in Rome" is pathetic and strong, the true poetic combination; and the "Brides of Christ," nine sonnets illustrative of incidents in the lives of S.S. Dorothea, Cecilia, Agnes, Catherine, etc., breathe all the genius of the poet and the fervor of the Christian. The sailor-poet has brought worthy offerings to the Muse, and has proved himself entitled to respond to the adjuration of his own "Sibyl,"—"Give while the gift makes sweeter all the world."

"SOLDIERS OF THE VICTORIAN AGE," by C. B. Low, I.N., F.R.G.S. In two vols. Chapman & Hall, London. Lieutenant Low has in these two volumes given himself a difficult task to perform,—to compress within the space of two volumes the lives and services of fifteen or sixteen of England's most celebrated commanders who have lived in our times; and that which renders it somewhat more difficult is that many of them are still living.

The author has contented himself in most cases with giving a short historical sketch of the services of his subjects, and, limited as is the space at his command, he has succeeded in making the work interesting and useful for reference.

"THE SHIPS OF THE ROYAL NAVY." Griffin & Co., Portsmouth. In this second volume of "Ships of the Royal Navy" those ranging from 1872 to 1880 are chiefly given in a series of twenty-five most truthful illustrations, admirably lithographed in colors from original drawings by Mr. W. F. Mitchell, who holds so high a reputation as a marine artist. As regards the descriptions of the vessels, they have been obtained from official sources. A more perfect work of its kind it would not be possible to obtain, neither could a more suitable book for the library of a naval officer be found.

COLBURN'S "UNITED SERVICE" with each succeeding number gives fresh proof of the enterprise, taste, and vigor that have so distinguished this veteran among service publications since it came under its present management.

AMONG the books announced for early publication in England are "THE FLIGHT OF THE LAPWING: A NAVAL OFFICER'S JOTTINGS IN CHINA, FORMOSA, AND JAPAN," by the Hon. Henry Noel Shore, R.N., to be published by Messrs. Longmans & Co.; and "THROUGH AMERICA: NINE MONTHS IN THE UNITED

STATES, INCLUDING A RESIDENCE OF SOME MONTHS IN UTAH AMONGST THE MORMONS," by W. G. Marshall, M.A. With illustrations. To issue from the press of Messrs. Sampson Low, Marston & Co.

No. 3 of our bright, cheery, and ably conducted contemporary, "THE ARMY AND NAVY MAGAZINE," comes to us full of good reading, and containing as a frontispiece a portrait of Sir Frederick Sleigh Roberts, the hero of Candahar. It is published by W. H. Allen & Co., 13 Waterloo Place, S. W., London.

MESSRS. L. R. HAMERSLY & Co. have just issued their "NAVAL ENCYCLOPÆDIA," which makes, including the appendix containing records of officers, a handsome volume of over one thousand pages. The following extract from the preface of the work will give its *raison d'être:*

"The sea is, so to speak, a world in itself. It has its own vegetable and animal life, and its own natural laws; while on its surface floats a multitude of vessels that serve either as the outlying defenses of the nations which border upon it, or as the carriers of the commodities which they find a profit in exchanging. This world of men and things, so peculiar and distinct, necessarily has a peculiar language, peculiar customs, and peculiar belongings. It is, moreover, a progressive world, and the arts and sciences that have relation to it are moving and developing *pari passu* with those that relate solely to the terrene portion of the globe. When to these considerations is added the fact that the sea is the especial field of operations of a profession which unites in itself the characteristics of the sailor and of the soldier, and to which is committed the high trust of maintaining the honor and dignity of the nation which it represents in all parts of the globe, and of extending over the citizens of its own country, wherever their business or pleasure may call them, the protecting ægis of the national flag, it would certainly appear that sufficient warrant exists for the issuing of this work, which has for its object the bringing together in one view, and within convenient compass, the several kinds of information most useful to naval officers, and most likely to be sought for by seafaring men of every name and grade. Nor is it only those that are by profession, or calling, identified with the sea who will find profit and instruction in this volume. There is a large and increasing class among the gentlemen of our own and other countries who cultivate the sea for the pleasure that it yields, and who take a manly delight in the danger and excitement incident to sporting upon its surface, to whom a book like this must prove an auxiliary of great value. To these may be added, as likely to find advantage in this book, all whose business, or love of knowledge, prompts them to investigate the science of that world which has its habitation in, under, or upon the waters of the great deep.

"We have already intimated that this work claims to be unique. It embraces, first, a complete dictionary of marine words and phrases; second, a large number of original articles on special topics; third, a copious fund of biographical data; and, fourth, a gazetteer of the principal naval stations and seaports of the world. No other work uniting these several features exists in our language, nor, we think we may confidently add, in any other."